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Study of Human Factors Variables in Battle Outcome Prediction Models

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BATTLE OUTCOME PREDICTION MODELS

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ABSTRACT

STUDY OF HUMAN FACTORS VARIABLES IN
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Over time there have been many improvements in models that are used to predict the outcome of battles. Currently there is much supposition and speculation surrounding the use of human performance related factors as additional inputs to battle simulation models to improve their accuracy. However there is no conclusive scientific evidence which shows that these factors do make a significant difference. This study investigates the use of factors that may impact on the human performance directly or indirectly in battle prediction models. These factors consist of traditional human factors and external factors that may influence the human performance. The research performs hypothesis testing to determine if these human factors aspects of a battle have a significant effect on the accuracy of battle prediction models. The data for this research consisted of a database from Concepts Analysis Agency with 660 data records, 138 different variables, and spans over 400 years. Neural networks and regression algorithms are used to create models based upon these inputs and test the significance of adding these variables to the traditionally used variables. This research failed to reject the hypothesis, which states there is no significant difference between battle outcome prediction models using the available human factors variables and battle outcome prediction models that do not include these variables. Also reflected in this study is the need for additional research leading to more complete and appropriate human factors data to be used in battle outcome simulation models.

This dissertation is dedicated to my parents,

Herbert and Ruth Glovier, and my fiancée

Cami Dennison.

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CHAPTER I

INTRODUCTION

For many years the Department of Defense, scientists, researchers, historians and others have tried to simulate battle scenarios and predict the outcome of such simulations. Some of the earliest work related to modeling of defense forces was by Frederick W. Lanchester, an English mathematician in 1916, who derived the Lanchester Equations. Since then, large sums of funding have been applied to problems associated with predicting the outcomes of battles and conflicts. There exist many offices within the Department of Defense (DOD), such as The Defense Modeling and Simulation Office (DMSO), Defense Advanced Research Projects Agency (DARPA), National Science Foundation (NSF), Naval Research and Development (NRAD) and many others who perform modeling and simulation tasking related to battle outcome prediction modeling. In 1995, the Joint Training Analysis and Simulation Center (JTASC) was formed within the DOD to perform battle simulations and use the results to train troops and perform crisis rehearsals. It is clear that the accuracy of battle outcome prediction models used by the DOD and organizations such as JTASC must be very high. New methods and techniques are continuously introduced to refine these models and simulations to provide more accurate results in this area. One alternative being considered is the use of human factors variables in battle simulations to investigate possible improvements in accuracy. Typically, battle simulations use only quantitative numbers such as "number of tanks" or "number of planes" to determine the winner of a battle. Generally, human factors data consists of variables which describe how humans interact with their environment,

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Turabian

systems, and other humans. This research will examine human factors variables which may have an impact on human performance in battle. Determining these human factors may be quite complicated and their inclusion in simulations requires a great deal of data collection and possibly changes in the basic algorithms used by the modeling and simulation developers to incorporate them. Currently many simulations models use a simple mathematical relationship or regression algorithm to estimate the relationship between the independent variables and the outcome of a battle. In order to take advantage of the human factors data and possibly improve battle outcome predictions, there will have to be additional collection of data and development of new models. There is a significant effort required to collect qualitative human factors data surrounding battles and to incorporate it in the simulations. To collect the qualitative data requires a great deal of historical research and it is subjective in most cases. The significance of human factors data is unknown in regards to the overall result. There is currently no scientific evidence that the addition of these qualitative human factors data will improve the results of the battle outcome prediction model.

Currently the battle prediction models take into account a number of variables. Most of these traditionally used variables are quantitative in nature such as number of tanks, airplanes, or ground troops involved in a battle. Some of the latest models such as The Theater Level Campaign Model (Hillestad and Moore, 1995) are beginning to look at adaptive systems to represent human decisions in the models, but have yet to use human factors as a variable for the outcome. Part of the apparent reasoning behind this selection of data is the ability of classical regression models to effectively analyze traditionally numerical data. The capability of the regression models is reduced in cases where data

may be noisy, incomplete or qualitative. Fuzzy data, such as the qualitative characteristics of human factors variables, falls into this category. Therefore it is hard for the traditional models to use these human factors variables, such as low moral or higher intelligence, in their predictions. Other alternatives to improve model accuracy have been explored such as the inclusion of additional qualitative variables and the implementation of neural networks. It is hypothesized by many battle historians and researchers such as Brewer, Davis and Dupuy (1977) that human factors variables are actually quite important in the prediction of battle outcomes. Some of the first references to human factors variables were by Dupuy (1977). He refereed to variables that are characterized as intangible factors that include sometimes calculable (combat effectiveness and logistics); probably calculable; not yet calculated (leadership, training experience and initiative); and intangible (morale, time, space, momentum, intelligence, and technology) (Dupuy, 1977). Even thought these variables were not referred to directly as human factors variables, this was the beginning to references to variables (i.e. leadership or training) which could be considered to fall in the category of human factors variables by today's definitions.

Problem Statement

There is much writing and conjecture surrounding the use of human factors variables in battle outcome prediction. The problem is that there is not a scientific study to show whether or not there is a significant contribution to the outcome prediction made by including these human factors variables. To compound this problem one must also consider the complexity of the data gathering for these type of data which is considered

to be subjective, costly, and time consuming. Whereas traditional quantitative datum collection surrounding battles is fairly straightforward.

Research Question

Taking all of this into consideration, one must question if it is justifiable to collect qualitative human factors datam and create models that can utilize it effectively if its contribution to the outcome may be insignificant. Therefore the primary research questions for this study include the following. Does the use of human factors data provide a more accurate outcome prediction than models that use traditional quantitative data alone? Should human factors variables be used in battle outcome prediction models to create a more accurate forecast?

Research Objectives And Issues

The primary objective of this research is to determine if human factors data can be effectively used in battle outcome prediction models to produce a more accurate prediction. The results of models which use human factors data is compared to the results of models which only use more traditional battle simulation data. This experiment uses neural networks and linear regression algorithms to provide a rigorous approach to modeling the system since the data used are qualitative and subjective. The expected contribution from this effort is the ability to determine if the inclusion of human factors data in battle analysis models produces a significantly more accurate prediction.

Hypothesis

In order to perform this research, the following hypothesis were formed to test the significance of human factors data in battle outcome prediction models.

H_0: There is no significant difference between classical battle outcome predictions which use traditional (non-human factors) data only and battle outcome predictions which use include traditional data and human factors data.

$$H_0: \mu_T = \mu_{T+H.F.}$$

where,

μ_T average prediction error by network using traditional data only, and

$\mu_{T+H.F}$ average prediction error by network using traditional data and human factors data.

H_1: There is no significant difference between classical battle outcome predictions which use traditional quantitative data only and battle outcome predictions that use qualitative human factors data only.

$$H_1: \mu_T = \mu_{H.F.}$$

where,

μ_T average prediction error by network using traditional data only, and

$\mu_{H.F.}$ average prediction error by network using human factors data only.

H_2: There is no significant difference between battle outcome predictions which use both traditional data and human factors data and battle outcome predictions which use include only human factors data

$$H_2: \mu_{T+H.F} = \mu_{H.F.}$$

where,

$\mu_{H.F.}$ average prediction error by network using human factors data only, and

$\mu_{T+H.F}$ average prediction error by network using traditional data and human factors data.

These hypothesis will be used in conjunction with the models built by the researcher to determine if these human factors variables demonstrate a significant increase in the accuracy of the prediction capability

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Issues

A portion of the data to be used for this experiment will be qualitative and subjective. This datum is largely based upon research done by historians and others in the areas surrounding military combat. It is noted that their outcomes could be considered subjective. For the purpose of this experiment, the data set is used as a basis for evaluation and will be considered to be a valid data set. This research will not dispute the validity of the data set since there are no better options available. The researcher accepts the constraints imposed by this and will use the data set as a typical chaotic system, from which predictions can be made.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Analysis of battle outcome data is not an uncommon topic. This is especially true within the Department of Defense. The DOD is becoming critically dependant on combat models (including simulations and war games) -- even more dependant than in the past....there has been far too little interest in the substance of the models and the validity (Davis, 1991). Large sums of money have been applied to problems associated with predicting the outcomes of battles and conflicts. There exist many offices within the Department of Defense, such as The Defense Modeling and Simulation Office (DMSO), Defense Advanced Research Projects Agency (DARPA), National Science Foundation (NSF), Naval Research and Development (NRAD) and many others who perform modeling and simulation tasking related to battle outcome prediction modeling. There exists a substantial amount of information on this subject, even though it is not widely available to the public. The vast majority of information obtained for this research effort was obtained through Military Command Technical Libraries and the Defense Technical Information Center.

Previous Work in Battle Outcome Prediction Modeling

Some of the most famous early work related to mathematical modeling of defense forces was by Frederick W. Lanchester, an English mathematician (Lanchester, 1916). This was the beginning of a series of studies based upon his equations that he used to

calculate the casualties in a war. These are known as the Lanchester Equations. According to Brewer (1979, p.77) the basic Lanchester equation may be represented as:

$$dr/dt = -\beta_1 b \qquad \text{And} \quad db/dt = -\beta_2 r$$

where r and b represent the number of red (enemy) and blue (friendly) forces in an engagement and β_1 and β_2 are the operational combat effectiveness coefficients for the opposing forces. Generally stated this shows that the attrition rate was equal to the size of the opposing forces multiplied by their operational combat effectiveness coefficient.

Solving these equations lead to other equations such as Lanchester's N-Square law and several others which were the basis of many studies, efforts, and models since then. Granted that these equations were great strides forward into modeling, they still left much to be desired as Brewer (1979, p.80) states in reference to Lundquist (1955),

> A more basic question addresses the usefulness of highly complex models when there is no reason to believe that they are adequate representations of the phenomenon studied or when the important additional factors cannot be evaluated. Furthermore, it is extremely difficult to apply any sort of mathematical model to human affairs because assumptions - that morale can be ignored as a factor in combat, for instance - frequently turn out to be unjustified . . . mathematicians are generally interested in solving equations, not about arguing about the subtle empirical meaning of their models.

This demonstrates that there was concern regarding the use of purely mathematical models to capture the effect of human characteristics. As discussed later, this adds to reasons for the use of neural network model, to escape the strictly quantitative nature of these models.

T.N. Dupuy provides the researcher with a significant amount of material on analysis of historical combat data. Dupuy discusses the chaotic nature of combat data (Dupuy 1977, 85). He attempts to demonstrate how easily the data can be interpreted in

many different ways, then later proceeds to provide methods by which he has used in analysis of these data. The one of the primary purposes of his book was to provide an overview of the Quantified Judgement Method of analysis (QMJ) which uses the Quantified Judgment Model to analyze the data. Dupuy collaborated with the Historical Evaluation and Research Organization (HERO) on the application of the historical information to current combat problems. It is noted that HERO later produced the database used in the research for this paper as a task for Concepts Analysis Agency. In a section on Identifying and Representing Combat Variables, Dupuy categorizes combat variables to include: sometimes calculable (combat effectiveness and logistics); probably calculable (mobility and vulnerability); not yet calculated(leadership, training experience and initiative); and intangible(morale, time, space, momentum, intelligence, and technology). These variables are the type that this study will focus on.

Dupuy has various other significant works that explore the evolution of warefare (Dupuy, 1980) which seem to have more of an historical prospective of the development of technology and weapons and their part as variables in the model. Many of these were also collaborated with HERO.

The Historical Evaluation and Research Organization and Concepts Analysis Agency has many contributions in combat data analysis, databases and studies. One of the more frequent authors on this topic is Robert Helmbold. He performed many studies and verifications related to the database used for this experimentation. These studies were verification and validation studies on the Concepts Analysis Agency's database. They were conducted over several years and utilized many resources. These are just two

of many studies on this data set, this researcher has many volumes of reports on database validation and verification from the agency.

Robert McQuie (1988) was another researcher from the Army Concepts Analysis Agency. Using data from 1937 to 1982, McQuie assembled ratios, percentages and rates for each variable for 260 different battles from this time frame. For each variable a range and median value was determined. These ranges and medians may serve as a criterion of credibility for the results of the wargames and combat simulations (McQuie, 1988). McQuie also provided a procedure for comparison of the results to these criteria. In this report he discusses the credibility of wargames and simulations. He points out that when a previous war is simulated, it should have results that reflect the actual outcome. This is the first step towards ensuring model credibility and validation.

During the time period from 1916 to 1988, a great deal of the work was done in battle simulation, especially when one considers the lack of computing capability. The field evolved from Lanchaster's attrition equations to databases of battles with statistical parameters to describe each variable over time. It is clear that the computer processing power began to change how battle simulations were approached.

Recent Work in Battle Outcome Prediction Modeling

Davis and Blumenthal (1991) address the importance of modeling and simulation in today's military environment. Davis refers to the qualitative changes in scenarios, operational concepts, weapons and forces. In reference to the content of today's models, Davis and Blumenthal state, "typically, ground combat situations focus on complex calculations of attrition while treating command control processes, tactics, and strategy in terms of stereotypes embedded in the databases." This ignores the evidence of history

that such matters (and other soft factors) are first order determinants of both deterrence and war outcome, and should therefore be highlighted.

Robert A. Kilmer has several contributions on combat data analysis. His dissertation, "Artificial Neural Network Megamodels of Stochastic Computer Simulations" (Kilmer, 1994) resurfaced in a recent article entitled Applications of Neural Network to Combat Simulations. This article discusses the need for emerging technologies such as Artificial Neural Networks (ANNs) in combat modeling. His modeling techniques are discussed along with a recommendation for continued research utilizing neural networks in combat simulation. Kilmer also has related articles in: Using Artificial Neural Networks to Approximate a Discrete Event Stochastic Simulation Model," (Kilmer and Smith, 1994); "Application of Neural Networks to Combat Simulations" (Kilmer, 1994); "Neural Networks as Megamodeling Technique for Discrete Event Stochastic Simulation." (Kilmer, Smith and Schuleman, 1994); "Neural Networks as Megamodeling Technique for Discrete Event Stochastic Simulation" (Kilmer, 1994); and "Application of Neural Networks to Combat Simulations" (Kilmer, 1995). Kilmer's research brings to light many advantages of using neural networks in combat modeling. A key point that Kilmer brings out in his works is that even though all models (regression and neural networks) require significant data to train, there is less sensitivity to the distributions and error when using neural networks.

Hillestad and Moore (1995) cover new techniques and concepts for combat analysis models. Adaptive systems are discussed for use in the models, but their use is aimed at the human decision making pieces and human interaction and control of the overall model. The model fails to use human factors as a variable in determining

outcome. This model, as many of the DOD models, must interact with other existing models. Therefore Hillestad and Moore could not simply just include a new variable into their model which none of the others are using. To add new variables, each variable would have to become an integrated part of the high level architecture which would allow them to be passed from one model to another in a distributed simulation.

Hedgepeth's research (1995) is a germane reference for this study. He compares the abilities of statistical regression networks to neural networks using the database provided by Concepts Analysis Agency. His research demonstrated that neural networks can be used as a valuable tool in the analysis for this type of datum. His results indicated that the neural network performed better with data that were incomplete than the regression networks. This will be of great benefit due to the nature of the database used in this analysis. Hedgepeth's (1995) research suggested that there is a strong correlation between the outcome and some of the qualitative data values such as: attacker surprise over posture awareness, number of artillery tubes, relative combat effectiveness, relative leadership advantage, relative moral advantage, relative intelligence advantage, and relative technology advantage. Hedgepeth also indicated that there was a need for further research in the areas regarding the human performance data involved in battle outcome predictions.

Human Factors

Another area integral to this research is human factors. The topic, Human Factors, has a wide variety of definitions. Peggy and Barry Tillman define human factors as "a body of knowledge about human abilities, human limitations, and other human characteristics that are relative..." to a design or system (Tillman, 1991). The Tillmans

refer to human factors and their application to the specification, design, evaluation, operation and maintenance of systems. The Tillmans' approach is more design oriented, but it still shows the significance of human factors data to the overall performance of the system.

Meister states that human factors encompass both research and application with a significant difference. "It emphasizes work or task performance—only the behavior that is relevant to task performance is of interest" (Meister, 1989). He also states that the parts of human factors that do not directly affect performance of the system or task are not of interest. Meister's perspective will be of significance to this research in defining which human factors variables to examine. In some of Meister's earlier works he defines human factors as those elements which influence the efficiency with which people can use equipment to accomplish a function or task. One of the more important elements he notes, which is applicable to this research, is the "personnel—not least, the capabilities and limitations of equipment operators and maintainers themselves (e.g. their intelligence and their visual, auditory and motor acuity, training and experience in operation of the equipment)" (Meister, 1971). He also refers to the significance of skill levels and functions which personnel must perform and how all of this affects other parts of the system. He summarizes the personnel elements of human factors as intelligence, sensory capability, motor capability, training, experience, and motivation (Meister, 1971).

Kantowitz and Sorkin refer to the "Person-Machine Systems" as an "arrangement of people and machines interacting within an environment in order to achieve a set of system goals" (Kantowitz and Sorkin, 1983). Kantowitz and Sorkin also refer to the importance of modeling and human factors. They state that modeling is necessary to

bridge the gap between problems and solutions in systems. "The model allows the user to make a reasonable guess in the absence of data."

This human factors information from this section is used to define human factors in terms of the battle simulation that this research addresses. This definition is applied to the data in order to determine their applicability to the models used for experimentation.

Data Collection

The type of data required for this research is historical data, from subject matter experts (i.e. historians and research organizations). The datum itself is quantitative and qualitative in nature, but provided by subject matter experts. Literature on this particular type of datum is different from that relating to market analysis and survey data. The source for these data was a secondary source. Patzer describes secondary data, not as inferior or unimportant, but just as data collected for another purpose (Patzer, 1995). Patzer states that secondary data is being used increasingly as the sole information to assist users of marketing research in their decision. Secondary data can be used for problem definition, research design, data analysis, and results. Some of Patzer's biggest advantages of secondary data were noted in savings of time and money. However in this research, the secondary data was the only source of data, without another battle to analyze, which would be quite impractical for the purposes of research. Patzer states that secondary data should not be accepted at face value. Important areas to evaluate in secondary data are age of data, categories of data, units of data and accuracy of data. Other things to consider in secondary data are source credibility, source trustworthiness, source succession, and source expertise (Patzer, 1995).

Van Maanen discusses some of the problems associated with qualitative data and its use in analysis. When using qualitative data, there are limitations placed on the possibilities for statistical analysis, replication and secondary analysis of the data. The creation of quantitative data sets provides a way to have systematic and replicable procedures that are essential to the scientific method. "The addition of quantified codes can result in the application of statistical procedures for assisting in the process of causal influence" (Van Maanen, 1983). These coding schemes were used as criteria by the researcher when selecting data sets for use with this experimentation in order to insure that statistical methods could be applied to the data set.

Creation of the quantitative data sets from the qualitative data requires that the researcher use proper scales to provide correct data sets. Nutt (1981) breaks these into four types of measurement scales: nominal scales, ordinal scales, interval scales, and ratio scales. Nominal scales are used to provide classification. "The numbers or symbols that are used create the nominal scale." Thus there is no relation among the categories. Ordinal scales provide categories and relation among the categories. Another property of ordinal scales is that there is no natural zero point. An example of ordinal scales would be a prioritization or ranking list. An example given by Nutt is the Likert scales used in surveys with groups such as: strongly agree, agree, disagree, or strongly disagree. "The categorization is nominal (responses fall into distinct categories), but the categories also have some relationship to each other." Interval scales have the same properties as ordinal scales, but also specify the interval between any two categories. The example given by Nutt for interval scales is temperature. Temperature can be measured in Centigrade or Fahrenheit. "The measurement unit and the zero point are arbitrary, but the scales have

fixed relationships so that the numbers can be transformed from one scale to another" (Nutt,1981). The only difference between interval scales and ratio scales is the addition of a non-arbitrary zero point. Ratio scales usually deal with direct measurements such as length or pressure. The properties of the ratio scale are equivalence, ordering, known intervals, and a defined origin.

During the course of data collection for this research, it was clear that these principles had been applied to the Concepts Analysis Agency database wherever possible, adding validity to the data used.

Results of Literature Review

Battle outcome prediction has evolved in great strides since Lancaster's equations were first introduced in 1916. The onset of computing power has allowed the area of research to evolve into elaborate simulations using large databases for information. Now, in the 1990s, researchers are beginning to use ANNs and other complex methods to analyze factors which researchers have never used before to continually create better models and simulations. One set of factors now being considered for use is human factors variables. This study has yielded many references to human factors data and their possible use in battle outcome prediction modeling. There has also been available a vast amount of material available on the collection and accuracy of battle outcome prediction data, human factors, data collection techniques, and neural networks. However, there was not available any scientific studies which address the significance of the human factors data to the prediction accuracy. Based upon these results, this research will focus on the significance of human factors data used as an input to battle outcome prediction models to improve their accuracy.

CHAPTER III

METHODOLOGY

The methodology for this research was more complex than originally anticipated by the researcher. Many seemingly simple tasks evolved into in-depth processes. The first task was the collection of the data. The researcher was required to investigate and search many sources and databases to find valid data. There had to be a large quantity of data to permit experiments to be performed. The next issue associated with the methodology was determining just how "human factors variables" are defined in relation to battle outcome simulations and models. There were many books on human factors engineering and ergonomics, but few which readily lent themselves to a functional definition for the researcher. Once the researcher had derived a functional definition for human factors variables, this definition had to be systematically applied to the data sets obtained for research to insure that the data collected met the definition for a human factors variable.

Another issue for the researcher was what type of models to use for this experiment. Once the models were selected, there were issues of what kind of output should be used. Along with these specific problems associated with this particular research, came the more traditional research issues such as randomization of data, exclusion of invalid data, design of the experiments, and how to analyze the vast amounts of data. The following sections show the researcher's methods for resolving all these issues for performing this set of experiments from data collection to analysis.

Data Collection

Selection of the data is a very important step of the experiment. There were many data sets to choose from in this type of experimentation. Due to the chaotic nature of this data, there may exist concerns regarding the validity of the subject data. The data set used is one provided originally by Army Concepts Analysis Agency (CAA). The data was originally collected in 1984 by the Historical Evaluation and Research Organization (HERO) for the Army to provide information on the nature and outcome of selected battles to a detailed level (Bader, 1986). Their reason for performing the study was to carry out the initial phase of the Combat History Analysis Study Effort (CHASE), whose ultimate purpose was "to search for historically based quantitative results for use in military operations research, concept formulation, warming, and studies and analysis" (Helmbold, 1987). Dr. Hembold of CAA stated that

> ... developing a data base adequate for use in model development and model validation is an extremely difficult task. It requires a very substantial investment in time, resources, and talent. The successful development of a high-quality combat data base requires a multidisciplinary approach in which military archivists and historians work together with military operations analysts, statisticians, epistemologists, and scientists with a strong hard science background (Helmbold, 1991).

Funded by the DOD and lead by Dr. Hembold, CAA further verified the original data in 1986 and 1987. Since the origination of this database, it has been used for many studies of this nature. CAA, Helmbold and Hedgepeth are just a few researchers who have used this data recently. Based upon the approach and usage of this database, this data set is used as the baseline for this experiment. The data serves as a typical representation of a chaotic data set that contains human factors data used for prediction purposes. Based upon the previous studies over many years (1982-1995), the researcher

accepts the validity of the data set since based upon the demonstrated substantial effort of others (Department of Army, Concepts Analysis Agency, Dr. Helmbold) to insure it's correctness. This study uses this data set to draw conclusions regarding the benefit of human factors data in modeling and simulation of chaotic systems.

The data set from CAA has information on over 660 battles in the database. The selected database covers over 400 years. The original database contained over 138 different variables as shown in Appendix A. Human factors data as applied to this research will focus on variables which describe and directly effect humans and their interactions with other humans, equipment, facilities, and the environment (Sanders and McCormick, 1987). These variables will indicate the human performance aspects of combat. To define human factors "in the context of battles" is a matter of studying definitions of human factors and selecting one that can be used to identify variables in a battle simulation.

Definition of Human Factors Variables

At the onset of the research it was assumed that defining human factors variables in relation to battle prediction would be a relatively straightforward task. It was desirable to use an existing definition from previously documented work, however one was not as readily available as previously assumed. In the course of performing the research, there were many different views and definitions of human factors across multiple domains of knowledge from engineering to psychology to industrial design.

One source of human factors information describes it as a field of applied science with certain basic principles (Sanders and McCormick, 1987). It is described as a reliance on scientific methods and use of objective data to generate basic data about

human behavior. Sanders and McCormick (1987) also refer to the use of empirical data and evaluation in the design process of machines and systems which humans interact with. Another definition of Human Factors, given by Dr. Alphonse Chapanis (1988), was "Human Factors is a body of knowledge about human abilities, human limitations, and other human characteristics that are relative to design." Peggy and Barry Tillman (1991) describe human factors as the science that combines "scientific research of human characteristics that must be considered in a design" and "application of human factors data to a design." While all of these initial definitions of human factors variables give definitions of the science, they do not easily lend themselves to define human factors variables in battle outcome prediction.

Dupuy (1977) was one of the first researchers to look at non-traditional variables as part of battle prediction. However, he did not describe them by name. While writing about battle prediction and identifying "combat variables", Dupuy has a section on intangible factors that include: sometimes calculable (combat effectiveness and logistics); probably calculable; not yet calculated (leadership, training experience and initiative); and intangible (morale, time, space, momentum, intelligence, and technology). While these intangible factors appear to be related to the definitions of human factors they are still just a grouping of variables which fall near other definitions of human factors.

David Meister (1989) provided one view that seemed to combine many of these definitions and data categories. He defines human factors as those elements that influence the efficiency with which people can use equipment to accomplish a function or task. One of the more important elements he notes that is applicable to this research is the "personnel—not least, the capabilities and limitations of equipment operators and

maintainers themselves" (Meister, 1971). He also refers to the significance of skill levels and functions which personnel must perform and how all of this effects other parts of the system. He summarizes the personnel elements human factors as: intelligence, sensory capability (visual acuity and auditory acuity), motor capability, training, experience, and motivation.

Explicitly stated, the definition of **human factors** for this research will be **those elements that influence the efficiency with which people can accomplish a function or task. These elements include intelligence, visual acuity, auditory acuity, motor acuity, training, experience, and motivation.**

Selection of Human Factors Variables

To determine the set of human factors variables for this research a selection methodology was developed which combined the derived definition with the available data. The first criterion for selection as a human factors variable was that the candidate variable must either fit the definition of a human factors variable as defined by this research or directly impact the defined human factors elements. The second part of the selection criterion was the requirement for data to be available for use in the analysis.

The definition provided by Meister (1971) was used as a guideline for selection of human factors variables in this research. He states that "human factors are those elements which influence the efficiency with which people can accomplish a task" (Meister 1971). These basic principles of his definition of these elements include intelligence, visual acuity, auditory acuity, motor acuity, training, experience, and motivation. These are referred to as "Human Factors Qualifiers" in this research. Webster's Dictionary (1985) defines these elements as follows:

Intelligence – the ability to apply knowledge to manipulate ones environment

Visual Acuity – Sharpness or keenness of vision

Auditory Acuity – Sharpness or keenness of hearing

Motor Acuity - Sharpness or keenness of motion

Training – the knowledge or experience acquired by one who trains

Experience – direct observation or participation in events as a basis of knowledge

Motivation – a motivating force, stimulus, or influence

These human factors qualifiers were used by the researcher for evaluation of each of the 144 variables used in the Concepts analysis Agency database (see Appendix A) to identify and categorize the human factors variables. There were 12 variables selected from the original list of 144. Subject matter experts in human factors (Francher) and modeling and simulation (Knight) verified the methodology and selection of variables by the researcher. Table 1 shows the descriptions of each successful variable that was matched against the "Human Factors Qualifiers" to define the data set for this research. It is noted that these human factors variables are divided into two categories. The first category consists of directly applicable human factors variables. The second group consists of external variables which may impact human performance in the associated areas. The summary of variables which met these human factors qualifiers is provided in the following text.

Variable Description	Human Factors Qualifier						
	Intelligence	Visual Acuity	Auditory Acuity	Motor Acuity	Training	Experience	Motivation
Human Factors Variables							
ATTACKER'S RELATIVE LEADERSHIP ADVANTAGE							X
ATTACKER'S RELATIVE TRAINING ADVANTAGE					X		
ATTACKER'S RELATIVE MORALE ADVANTAGE							X
ATTACKER'S RELATIVE INTELLIGENCE ADVANTAGE	X						
External Impact on Human Performance							
PRIMARY LOCAL TERRAIN DESCRIPTION		X	X	X			
SECONDARY LOCAL TERRAIN DESCRIPTION		X	X	X			
PRIMARY LOCAL WEATHER DESCRIPTION		X	X	X			
SECONDARY LOCAL WEATHER DESCRIPTION		X	X	X			
TERTIARY LOCAL WEATHER DESCRIPTION		X	X	X			
DEGREE OF INFLUENCE OF WEATHER		X	X	X			
DEGREE OF INFLUENCE OF TERRAIN		X	X	X			
DEGREE OF INFLUENCE OF LEADERSHIP							X

Table 1: Selected Human Factors Variables

Attacker's Relative Leadership Advantage

The first category selected is described as the attacker's relative leadership advantage (LEADA). This was selected because leadership may affect the ability to provide motivation for the personnel. To have a leadership advantage, one must be able to motivate their forces effectively. Also leadership directly effects the motivation of the humans under ones leadership. The categories for this variable ranged from very strongly favors the defender to very strongly favors the attacker.

Attacker's Relative Training, Morale, And Intelligence Advantage

Training, morale, and intelligence were directly sited in the literature and appeared exactly as data variables in the CAA database. Therefore the selection of "Attacker's Relative Training Advantage" (TRNGA), "Attacker's Relative Morale Advantage" (MORALA), "Attacker's Relative Intelligence Advantage" (INTELA) were

obvious selections for human factors variables. They also ranged from very strongly favors the defender to very strongly favors the attacker.

Primary and Secondary Local Terrain Descriptors

The first group of variables which fell into the "External Impact on Human Performance" category were "Local Terrain Descriptors." These consisted of variables which described the Contour (Rugged, Rolling, Flat, Other or not available), Tree Coverage and Foliage (Heavily Wooded, Mixed, Bare, Desert, Other or not available), and the type of terrain (Urban, Marsh or swamp, Dunes,). These were selected because they affect human performance by influencing (directly or indirectly) visual, auditory, and motor acuity. For example, trees and foliage have a distinct impact on human sight and hearing in a battle environment.

Primary, Secondary, and Tertiary Local Weather Descriptors

The next set of variables which met the human factors qualifiers were "Local Weather Descriptors." These variables consisted of moisture (Wet, Dry, Other), precipitation (Heavy Precipitation, Light Precipitation, Overcast [no precipitation], Sunny [no precipitation], Other or not available), temperature (Hot, Temperate, Cold, or Other), and general climate (tropical, desert, temperate, other). Once again, these variables were selected because they directly effect human performance through influencing visual, auditory, and motor acuity.

Degree of Influence of Weather, Terrain, and Leadership

Degree of influence was a separate variable which described the effect of several of the human factors variables (weather, terrain, and leadership) that each had on the individual battle.

Excluded Data

Some data records and variables were excluded from the model. Two battle data records were removed from the database because the battle outcome for these records is unknown. There were also several variables removed from the data set. One group of variables only contained names of people and locations that were not repeated in other battles, therefore no patterns could be detected or derived from them. This set of variables removed included:

- Name of the War in Which Battle/Engagement Was Fought
- Name of the Battle/Engagement
- Location Where Battle Was Fought
- Campaign in Which Battle Was Fought
- Designation of the Attacking Forces
- Name of the Attacking Force Commander
- Designation of the Defending Forces
- Name of the Defending Force Commander

The next set of variables excluded were those which were those which were directly correlated to the outcome of the battle such as win or loss and "mission accomplishment score." A complete listing of these is provided below.

- Attacker's Win/Draw/Lose
- Attacker's Mission Accomplishment Score
- Defender's Mission Accomplishment Score
- Attacker's Primary Resolution/Outcome
- Defender's Primary Resolution/Outcome

The last set of variables which were excluded were those which did not relate to the battles, but were statistics regarding the data set itself such as error rates and descriptors. The complete list of these is provided below:

- Attacker Strength Error
- Attacker Casualty Error
- Defender Strength Error
- Defender Casualty Error

Battle Outcome Prediction Models

The primary tool for analysis in this experiment was a artificial neural network (ANN). The ANN was selected due to its ability in pattern recognition, classification, and prediction. To provide an additional means of analysis and comparison, models

based on linear regression were also utilized. The neural network and linear regression models were used to predict the outcome of a battle based upon the input variables.

Neural Network Models

Three ANN models were developed for analysis of human factors. The three models consisted of: NN1 (T+HF) which used both traditional and human factors data as inputs; NN2 (T) which used only traditional data as inputs; and NN3 (HF) which used only human factors data as inputs to the model. The outputs from these three models were then compared to one another to perform testing for each hypothesis.

H_0: NN1 (T+HF) vs. NN2 (T)

H_1: NN1 (T+HF) vs. NN3 (HF)

H_2: NN2 (T) vs. NN3 (HF)

A backpropogation neural network model was selected with the basic architecture shown in Figure 1. Each model consisted of an input layer, one hidden layer, and one output node. The input for each model consisted of each of the variables selected for NN1, NN2, or NN3. At each of the input nodes, the input is transformed (as described later in "Data Transformations") and passed to every hidden layer.

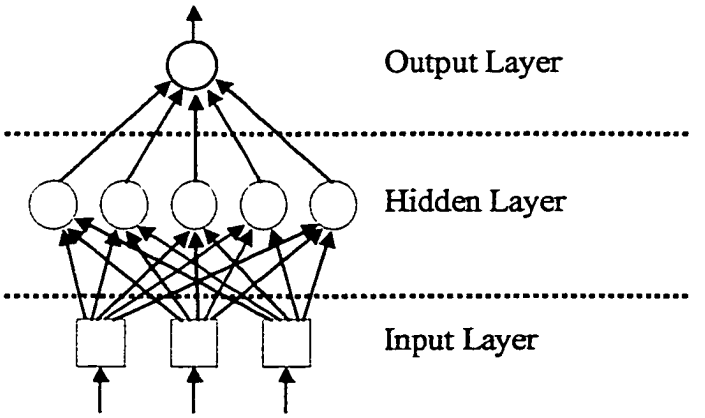

Figure 1: Neural Network Architecture

The size of each hidden layer was optimized during the training of the model by allowing the computer software (NeuralWare Predict) to vary the size of the middle layer from 0 to 200 nodes until the ideal size was determined. The hidden layer neural nodes can be depicted shown in Figure 2.

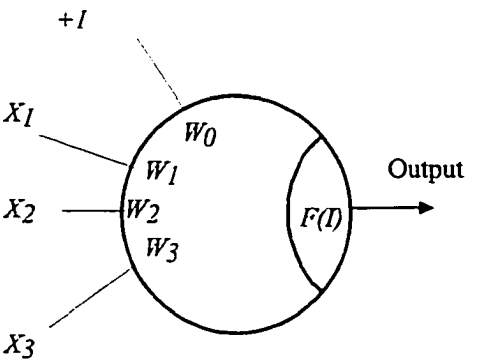

Figure 2: Neural Node

The transfer function, F(I), used by the nodes hidden layer is the sigmoid function. The sigmoid function is represented as:

$$F(I) := \frac{1}{1 + e^{<-I>}}$$

where I is equal to the sum of the inputs (X_i) multiplied by their perspective weights (W_i).

$$I = W_0 + W_1X_1 + W_2X_2 + \ldots + W_NX_N$$

This output of the sigmoid function is shown in Figure 3.

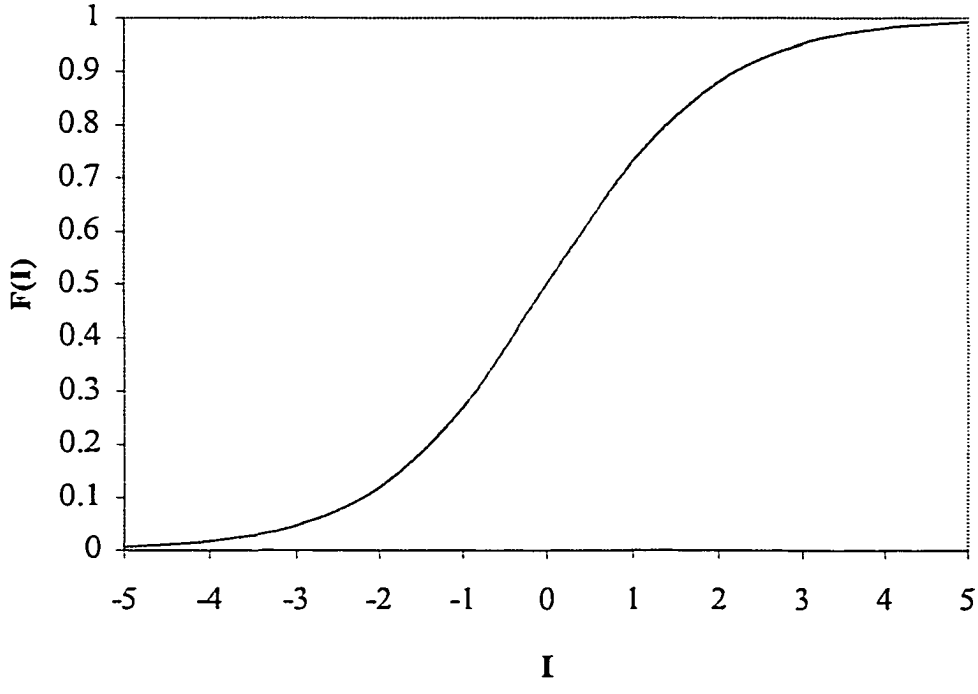

Figure 3: Sigmoid Function

The nodes are trained using backpropogated error information to adjust the weights of the hidden nodes. The Bernoulli objective function is used to evaluate the performance of the models and for convergence during training. This is represented by:

$$-\frac{1}{\log(2)}\frac{1}{T}\sum_{t=1}^{T}\frac{1}{M}\sum_{m=1}^{M}\left(d_m^{(t)}\log\left(y_m^{(t)}\right)+\left(1-d_m^{(t)}\right)\log\left(1-y_m^{(t)}\right)\right),$$

where T is the number of training or test cases and M is the number of output nodes(NeuralWare 1997).

This objective function works with the Adaptive Gradient Learning algorithm to train the weights in each model (NeuralWare 1997). This learning algorithm requires derivatives of the objective function with respect to weights to calculate a search direction. During the training phase, the direction vector passed to the algorithm is determined by $\mathbf{d}_c$ for the hidden layer candidate and $\mathbf{d}_o$ for the output layer node as follows (NeuralWare 1997):

$$\mathbf{d}_c = \left(CndLCoef \frac{\frac{\partial J}{\partial \mathbf{w}_{ci}}}{\left\| \frac{\partial J}{\partial \mathbf{w}_{ci}} \right\|}, OutLCoef \frac{\frac{\partial J}{\partial \mathbf{w}_{co}}}{\left\| \frac{\partial J}{\partial \mathbf{w}_{co}} \right\|} \right)$$

$$\mathbf{d}_o = OutLCoef \frac{\frac{\partial J}{\partial \mathbf{w}_o}}{\left\| \frac{\partial J}{\partial \mathbf{w}_o} \right\|}$$

Where,

J is the objective function for the model,

$\mathbf{w}_{ci}$ is the incoming hidden node weight,

$\mathbf{w}_{co}$ is the outgoing hidden node weight,

$\mathbf{w}_o$ is the complete vector of weights to the output layer,

OutLCoef is the learning rate for the output, and

CndLCoef is the Hidden Learning Rate.

A line search takes place between

$$\mathbf{w}_c \text{ and } \left(\mathbf{w}_c + CndLSAlpha \cdot \mathbf{d}_c\right)$$

for the candidate training phase, and between

$$\mathbf{w}_o \text{ and } \left(\mathbf{w}_o + OutLSAlpha \cdot \mathbf{d}_o\right)$$

for the output weight training phase.

Where,

CndLSAlpha specifies the initial limits of the line search for Adaptive Gradient hidden layer training (NeuralWare 1997), and

OutLSAlpha specifies the initial limits of the line search for Adaptive Gradient output layer training (NeuralWare 1997).

To perform the line search, Brent's Method is used (NeuralWare, 1997). Brent's method, which combines root bracketing, bisection, and inverse quadratic interpolation to converge (Numerical Recipes Software, 1992), is used to search along that direction for a minimum of the objective function. This process is repeated until a local minimum of the objective function has been found. The correlation between the weights at the end of the current pass and the weights at the end of the previous pass is calculated and if this

correlation is above a stability threshold the learning phase has reached the criteria for stabilization.

After optimization of each ANN, the specific layer sizes for each neural network model are as follows. The first neural network model (NN1) which used both traditional variables and human factors variables consisted of 145 input nodes, 200 hidden layer nodes and one output node. The second neural network model (NN2) which used traditional variables only consisted of 109 input nodes, 182 hidden layer nodes and one output node. The third neural network model (NN3) which used human factors variables only consisted of 36 input nodes, 198 hidden layer nodes, and one output node.

The neural network model used for this analysis was implemented using the NeuralWare Predict Software (1997). The software was selected because of its ability to automatically condition the input data and to extensively vary and test the configuration of the hidden nodes of the neural network to maximize the performance of the model.

The software performed data transformations in order to transform the data into inputs that were useable by the model. The software application utilized for this set of experiments provides mechanisms to automatically transform the raw data into formats suitable for neural network training. A variety of analyses are performed to the input field to determine how it might be transformed to maximize the performance of a network. The basic concepts for transforming data were derived from "Exploratory Data Analysis" by John W. Tukey (Addison-Wesley, 1977) and "Regression Analysis by Example" by Samprit Chatterjee and Bertram Price (John Wiley & Sons, 1991).

Data Analysis

The Data Analysis module of the software analyzes each data field and determines the type of field and the types of transformation that will convert the field for effective use by the model. The basic types of encoding used by the model are categorized below:

Continuous: Linear (or continuous) encoding uses one input to provide a continuous output that scales the numeric data it into a range from 0 to 1. Linear encoding can be used for numerical or symbolic data.

Binary: Binary encoding recognizes that the linear (continuous) encoding has no meaning, and maps the various enumerated values into an arbitrary binary code using two network inputs. Binary encoding can be used to categorize symbolic data. For example, if a field such as "training" had four possible symbolic values (none, limited, average, and extensive) the values may be transformed into a 00, 01, 10, 11 inputs. In this case would actually create two binary input fields in place of the original one symbolic field.

One-of-N: Another encoding scheme is the One-of-N method that creates a field for each category of data. In the example above, "training = none" would have one input and it's value would be one.

An example of how symbolic or enumerated data for "training level" could be transformed as follows.

Symbolic Data	Enumerated Data	Linear	Binary	One-of-N
None	1	0.250	0 0	1 0 0 0
Limited	2	0.500	0 1	0 1 0 0
Average	3	0.750	1 0	0 0 1 0
Extensive	4	1.000	1 1	0 0 0 1

Data transformations are performed by the software to achieve the above data types. A complete list of data transforms is provided in Appendix D. Also provided in Appendix E is a detailed excerpt from the NeuralWare Predict™ manual on the coding of the data transforms.

Another significant software parameter used was the "no variable selection" setting which was used in order to insure that all variables were included in the modeling process. Otherwise the software could elect not to use a variable based upon correlation to the output. While this may be good for creating the most accurate model, it was not considered acceptable for comparison between alternative models since different variables could be selected for each model.

Regression Models.

In addition to the ANN models, three regression models were also developed for analysis of human factors. Following the ANNs, the three models consisted of: LR1 (T+HF) which used both traditional and human factors data as inputs; LR2 (T) which used only traditional data as inputs; and LR3 (HF) which used only human factors data as inputs to the model. The outputs from these three models were then compared to one another to perform testing for each hypothesis.

H_0: LR1 (T+HF) vs. LR2 (T)

H_1: LR1 (T+HF) vs. LR3 (HF)

H_2: LR2 (T) vs. LR3 (HF)

The software utilized, also allowed for regression models to be constructed in the same manor as the neural network model with the exception that there is no hidden layer between the input and the output. The output of the model is changed from sigmoidal to linear as shown in Figure 4.

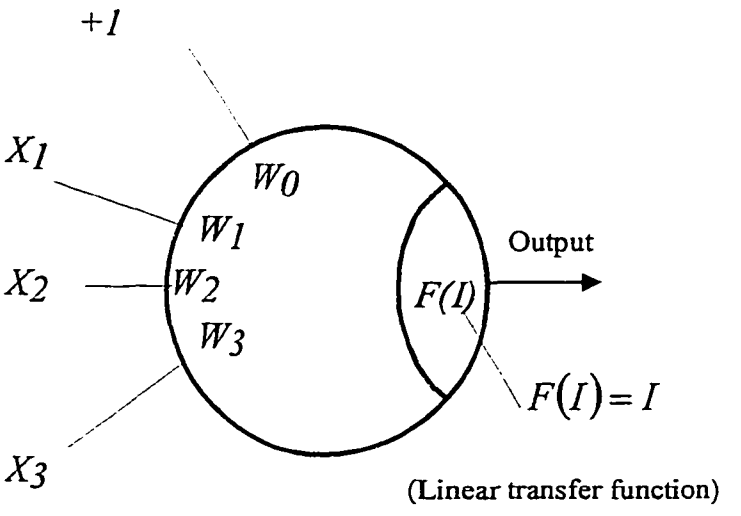

Figure 4: Regression Model

This creates a linear regression model where the output is simply equal to the sum of the inputs times their weighted values (NeuralWare 1997).

$$F(I) = I = W_0 + W_1X_1 + W_2X_2 + W_3X_3$$

This linear regression model is solved using the least squares method to determine the coefficients for the linear equation (NeuralWare 1997).

The specific sizes for each linear regression model are as follows. The first linear regression model (LR1) which used both traditional variables and human factors variables consisted of 145 inputs one output. The second linear regression model (LR2) which used traditional variables only consisted of 109 inputs and one output. The third linear regression model (LR3) which used human factors variables consisted of 36 inputs and one output.

Continuous and Discrete Outputs

The model error is evaluated in two formats, continuous and discrete. The normal output of the regression and neural network models in a continuous format (real number between –1 and 1). This number is compared to the actual outcome of each battle to determine the error for each case. The error was determined by:

$$\text{Error} = \text{Actual Outcome} - \text{Predicted Outcome}$$

For the output from the model to be converted to a discrete value a rounding function is employed. These categories are

$$\text{Lose} = -1, \quad \text{for } -1 \le X < -0.5$$

$$\text{Draw} = 0, \quad \text{for } -0.5 \le X < 0.5$$

$$\text{Win} = 1, \quad \text{for } 0.5 \le X \le +1$$

Then these values are used to calculate the error and perform the analysis of variance for this hypothesis testing.

Randomization

The data sets were randomly chosen by means of a simple pseudo random number generator. The data was sorted based upon the random number generated and divided into independent sets for training and testing. Using the generally accepted practice, the data base was allocated for testing and training in an 80\20 ratio to provide for an adequate independent test set. The random number sequence used is provided in Appendix F.

Missing Data Indicators

During the course of experimentation, a question regarding the structure of the data sets was considered by the researcher. The data provided by Concepts Analysis Agency had been optimized for use with traditional regression networks. In cases where data was missing from a particular variable, a marker was used to indicate this condition as opposed to leaving it blank. The reason for this is because the regression algorithms cannot use the data set if there are variables missing (i.e. the mathematical equations are not complete). To address this problem, a value such as –9 may be substituted into the field thus allowing one to use regression techniques. The neural network used for this experimentation will allow for missing data values and the manufacturer recommends not using missing value indicators. To resolve the issue of which data modeling paradigm to use, the researcher chose to use both data sets to compare the results. As the reader will later see, both methods provided similar outcomes.

Experiments

In order to test the Hypothesis, the variables for experimentation were divided into three groups. One group was a set that contained all of the variables, both traditional and human factors variables (T+HF). The second group consisted of only the traditional variables (T), such as those typically used by model owners now to predict outcomes of independent variables. The third group consisted of only the human factors variables (HF) used to describe the human performance characteristics of the data sets. The experimental matrix is shown in Figure 5.

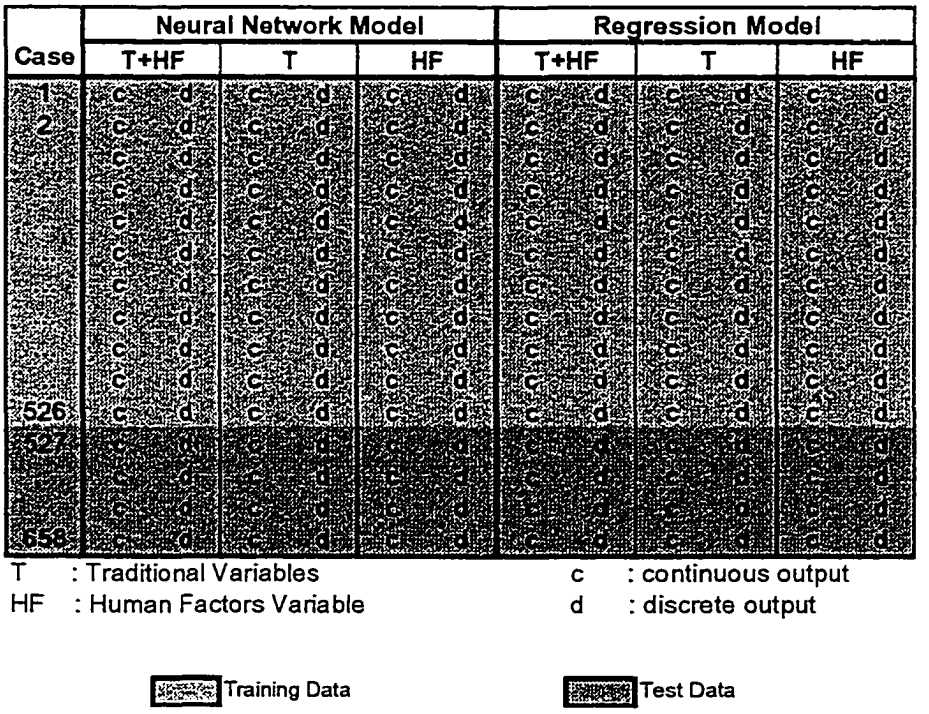

Figure 5: Experimentation Matrix

There were two sets of experiments performed to provide the researcher with a baseline for the analysis. The first set of experiments uses a neural network model and

the second set of experiments uses a regression model. Regression and neural network tools where both considered in order to provide a more rigorous analysis of the data sets. Both models also have outputs in a continuous and discrete fashion to allow more analysis of the error.

Analysis of Results

After all experiments were performed, the error was calculated for each data set. After the error for each data set is determined, an analysis of variance (ANOVA) was performed for each hypothesis. For the ANOVA a significance level of 95% is desired, therefore the value of α was 0.05.

It is noted that there will be two sets of results from the experiments. One set for the neural network analysis and another for the regression analysis. It was expected to have similar results from each analysis tool, but each one was treated as a separate case and compared to the other.

From the ANOVA tables, the researcher was able to utilize the F-Values to determine if there was a significant amount of difference in the error for the hypothesis tests.

CHAPTER IV

RESULTS AND DISCUSSION

Following the described methodology, the experiments were executed and the results were recorded in an experimental matrix as previously described in Figure 5. The complete results from each network model are displayed in Appendix C. The results from these models will then be used to test the hypotheses. In Appendix C the results from each model are categorized as follows.

NN- Traditional + HF: This utilizes a neural network to predict outcomes based on traditional variables and human factors variables.

NN - Traditional Only: This utilizes a neural network to predict outcomes based on Traditional Variables.

NN - HF Only: This utilizes a neural network to predict outcomes based on Human Factors Variables.

LR - Traditional + HF: This utilizes a linear regression model to predict outcomes based on Traditional Variables and Human Factors Variables.

LR - Traditional Only: This utilizes a linear regression model to predict outcomes based on Traditional Variables and Human Factors Variables.

LR - HF Only: This utilizes a linear regression model to predict outcomes based on Traditional Variables and Human Factors Variables.

The subcategories for each of these prediction models are as follows:

Output – This is the predicted outcome produced by the model.

Error – This is the difference between the actual outcome and the predicted outcome.

C – This indicates that the output or error is in a continuous format

D – This indicates that the output or error is in a discrete format.

This section will examine closely the error generated by each model. The data generated is from an independent, randomly selected, test set. This test sets are used for all of the models to insure consistency across the results.

Hypothesis 0 (H_0)

The null hypothesis, H_0 ($\mu_T = \mu_{T+H.F.}$), examines if there is a significant difference between classical battle outcome predictions which use traditional (non-human factors) data only and battle outcome predictions which use include traditional data and human factors data. This hypothesis is evaluated using neural network models and linear regression models in both continuous and discrete output formats. The results for each of these four cases are listed in the following section.

Neural Network – Continuous Output

The scatter plot of the error generated by the neural network models is shown in Figure 6. By observation there are slightly more cases of error, greater than 0.5, for the models which do not contain the human factors variables (17 cases vs 12 cases). This is addressed further in the analysis of variance.

Table 42 shows results of the Analysis of Variance (ANOVA) using a neural network with a continuous output to examine this relationship. In the independent, randomly selected test data the error only increases from 24.35 to 25.04 (difference of 0.69) when the human factors are removed from the model.

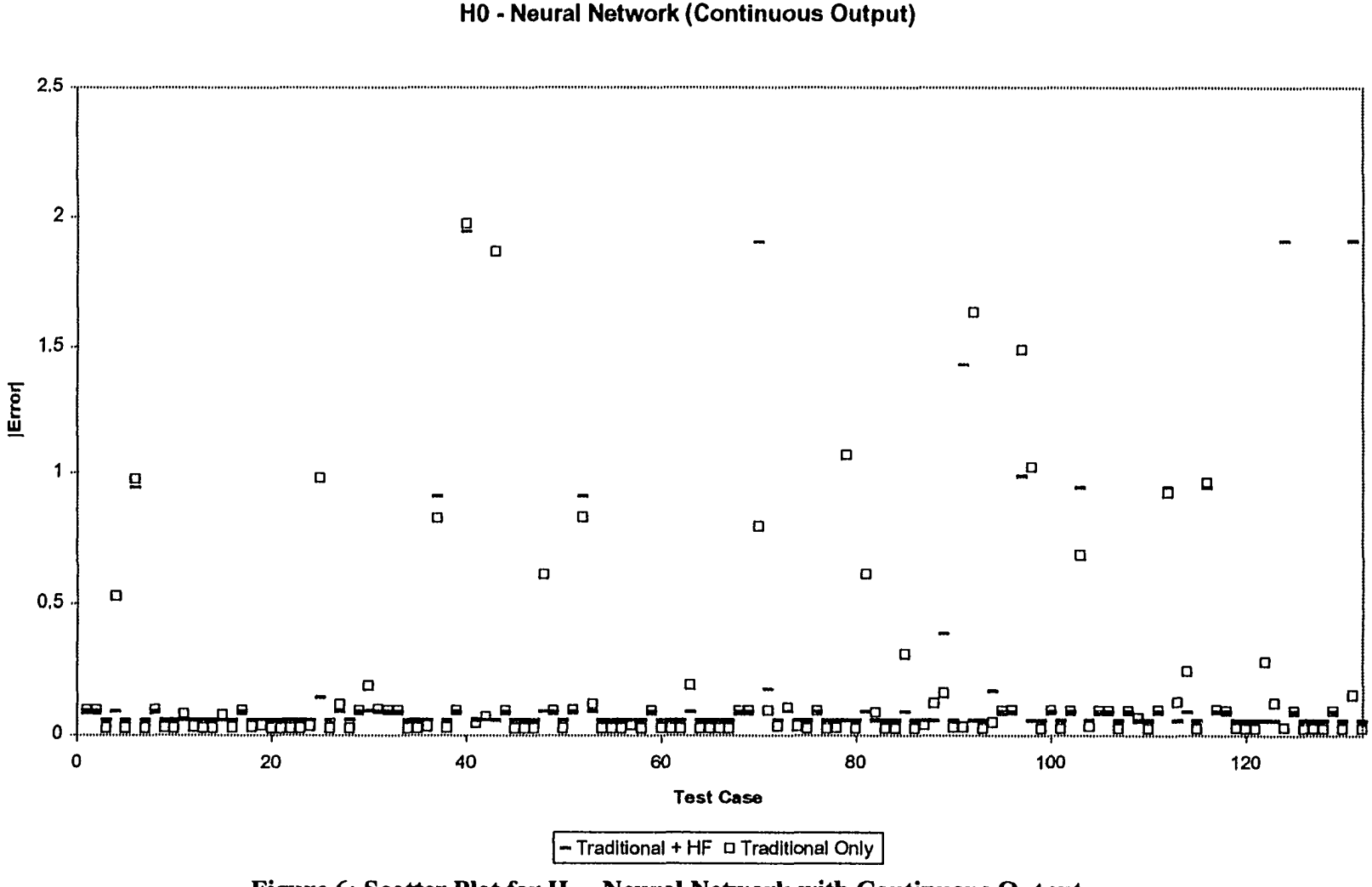

Figure 6: Scatter Plot for H_0 - Neural Network with Continuous Output.

The critical value of F for this data set is 3.8 at a confidence level of 95%. The test data produced an F-Value of 0.01, which is no where near the critical value. With this F-Value for the independent test set it is clear that the addition of these human factors variables did not produce a significant difference for this data set using a neural network model.

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	24.35095298	0.184476917	0.146726721
Traditional Only	132	25.04956335	0.189769419	0.134737566

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	0.001848699	1	0.001848699	0.013136293	3.877204335
Within Groups	36.87182167	262	0.140732144		
Total	36.87367036	263			

Table 2: ANOVA for H_0 -Neural Network with Continuous Output

Neural Network –Discrete Output

This part of the experiment utilizes the same basic model structures as the first part with the exception of the output of the model. As explained earlier the raw data output from the model is placed into discrete categories based upon its value. These categories are:

Lose = -1, for $-1 \leq X < -0.5$

Draw = 0, for $-0.5 \leq X < 0.5$

Win = 1, for $0.5 \leq X \leq +1$

These values are used to calculate the error and perform the analysis of variance for this hypothesis. Figure 7 shows the scatter plot for the error calculated in association with the neural network and a discrete output. The results of the scatter plot are similar to the continuous case for the discrete case, with the exception that the data is placed into discrete categories which has the effect of removing all error below 0.5. This is also closer to the way in which the data results are calculated by the subject matter experts (i.e. win, lose, or draw as opposed to a continuos value from –1 to 1).

Table 3 shows the ANOVA for the traditional and human factors variables vs. traditional variables using a neural network with a discrete output. By changing to the discrete output, the case where error < 0.5 goes to 0, thus affecting the overall analysis of variance. The sum of the error for the independent test data goes from 16 to 20 (difference of 4) when the human factors variables are removed. The randomly selected test data produced an F-Value of 0.35. The critical value for this experiment at a 95% confidence level is 3.85. Therefore independent test set showed no significant difference in the output when the human factors variables were removed from the model.

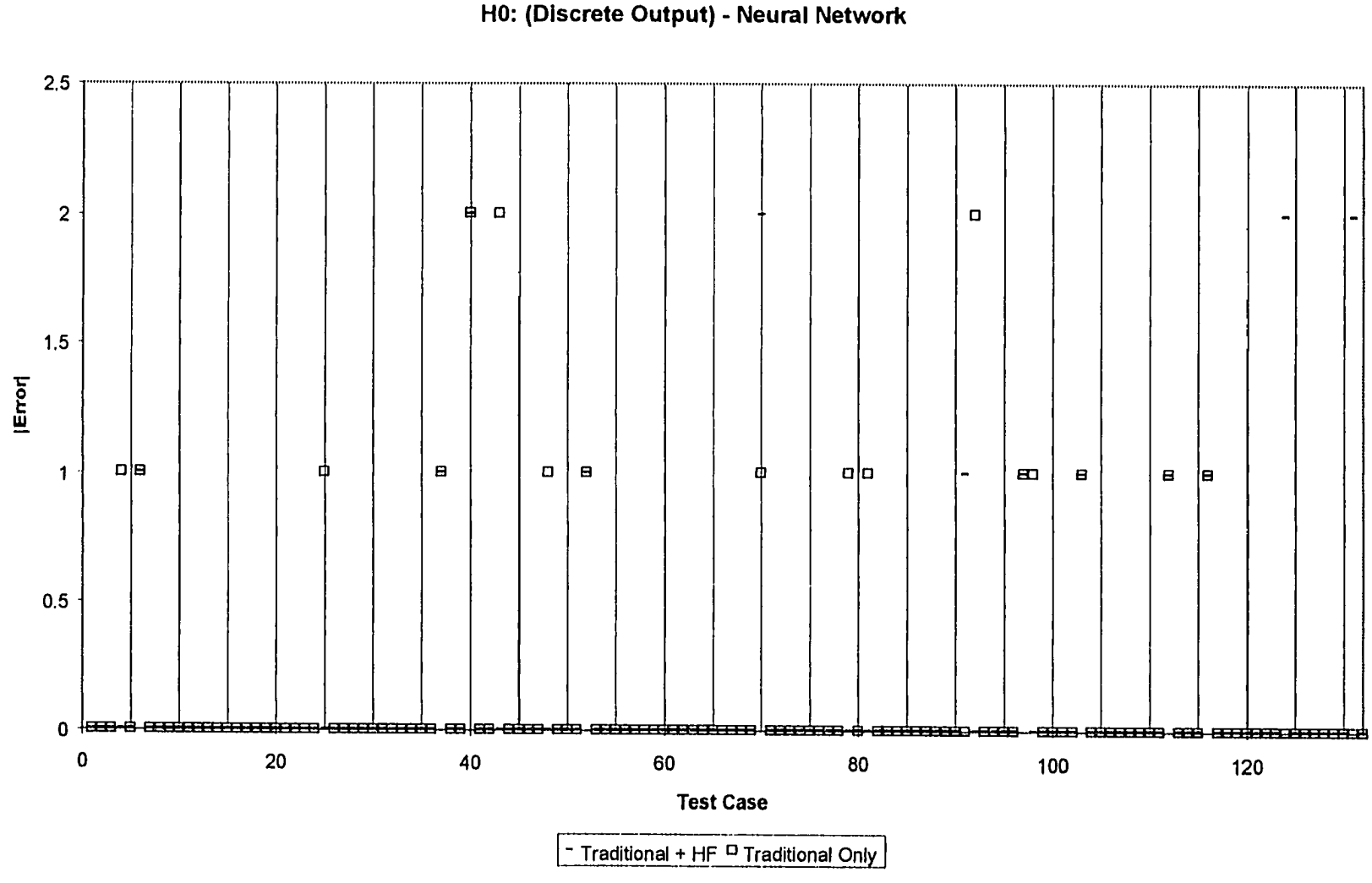

Figure 7: Scatter Plot for H_0 - Neural Network with Discrete Output.

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	16	0.121212121	0.168401573
Traditional Only	132	20	0.151515152	0.175341198

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	0.060606061	1	0.060606061	0.352624495	3.877204335
Within Groups	45.03030303	262	0.171871386		
Total	45.09090909	263			

Table 3: ANOVA for H_0 - Neural Net with Discrete Output

Linear Regression – Continuous Output

The next experiment uses a linear regression model to predict the values of the outcome. Figure 8 shows the Scatter plot for the error produced by the linear regression model using a continuous output function. It is noted that the scatter plot for the linear Regression model contains more error. By observation, it appears that both systems have a great deal of error associated with them.

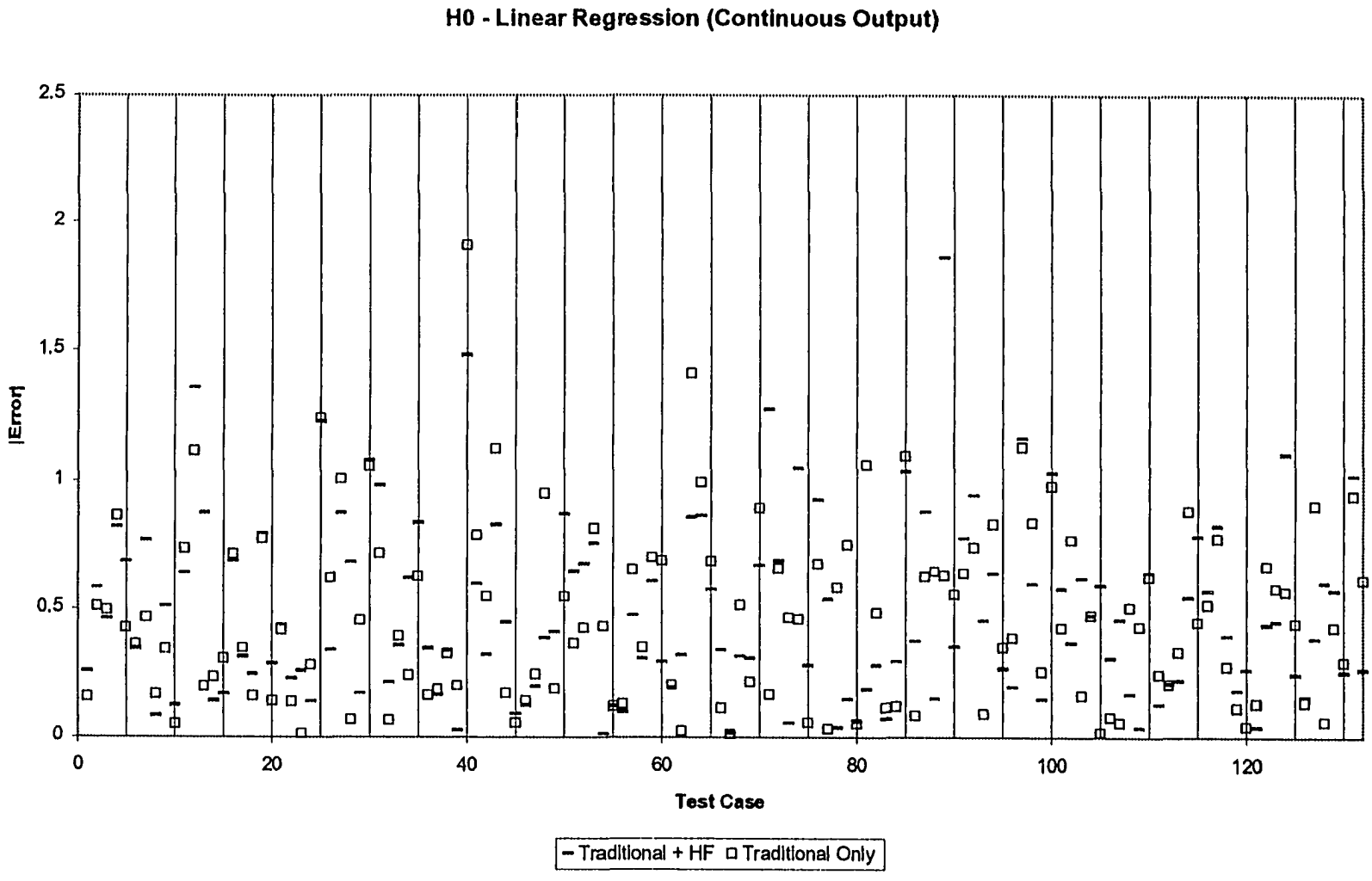

Figure 8: Scatter Plot for H_0 - Linear Regression with Continuous Output

Table 4 shows the ANOVA for traditional and human factors variables vs. traditional variables using a linear regression model with a continuous output function. The error produced by the independent test data actually decreased from 64 to 61 (difference of 3) when the human factors variables were removed. This was not a significant decrease with a F-Value = 0.20 compared to F-Critical = 3.88.

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	64.0679841	0.485363516	0.120755271
Traditional Only	132	61.53216243	0.466152746	0.119085262

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	0.024357544	1	0.024357544	0.203114491	3.877204335
Within Groups	31.4191098	262	0.119920266		
Total	31.44346735	263			

Table 4: ANOVA for H_0 - Linear Regression with Continuous Output

Linear Regression – Discrete Output

Figure 9 shows the scatter plot for the error calculated in association with the linear regression modeling using a discrete output function. There does not appear to be observable difference in the two sets of variables.

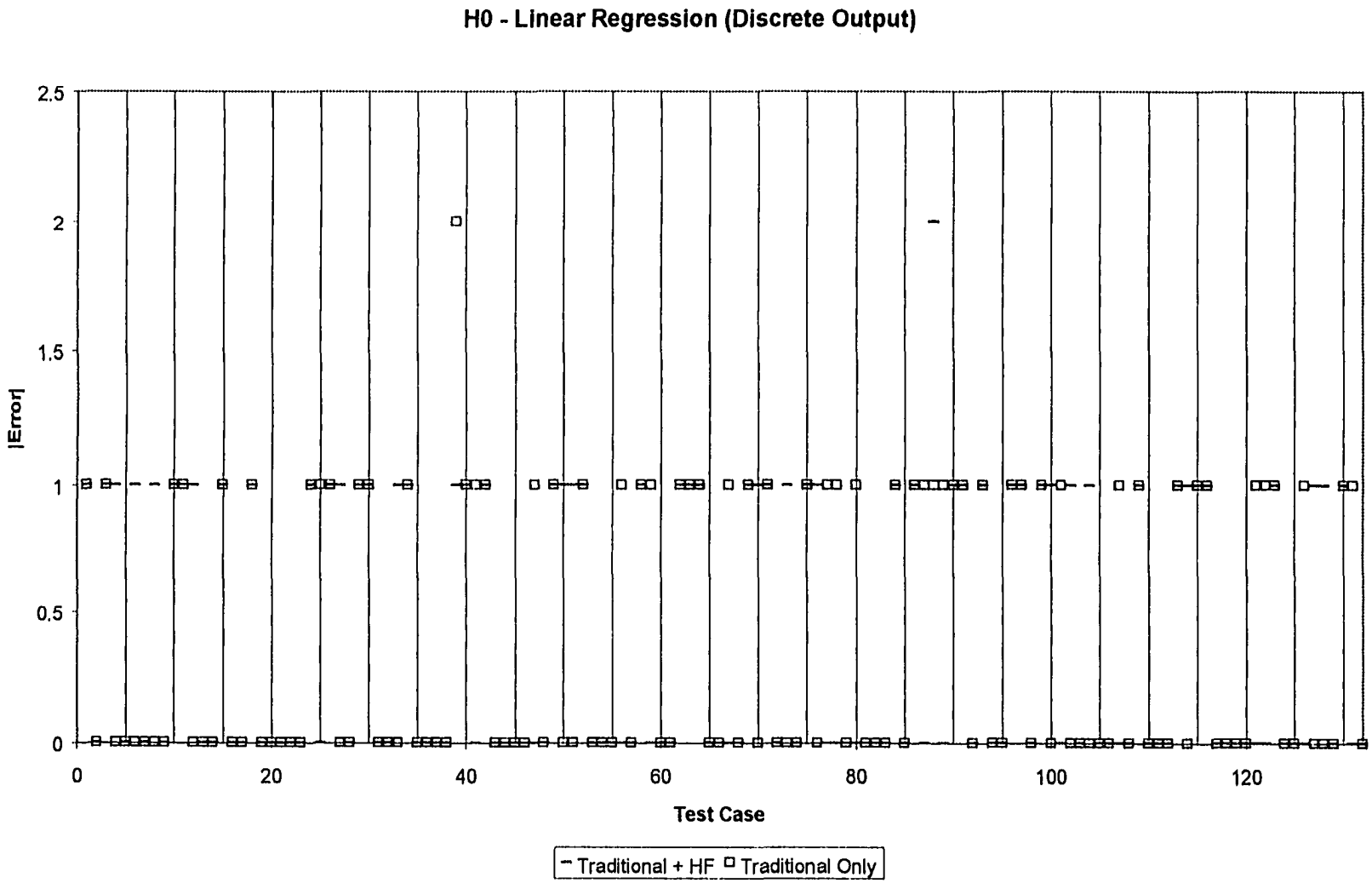

Figure 9: Scatter Plot for H_0 - Linear Regression with Discrete Output

Table 5 shows the ANOVA for the error produced by the linear regression with a discrete output. As was indicated previously by the scatter plot, the difference between the two sets is 0. Each set has an error of 56. Thus providing an F-Value of 0, which is clearly not a significant increase when using independent test data.

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	56	0.424242424	0.261392551
Traditional Only	132	56	0.424242424	0.261392551

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	0	1	0	0	3.877204335
Within Groups	68.48484848	262	0.261392551		
Total	68.48484848	263			

Table 5: ANOVA for H_0 - Linear Regression with Discrete Output

Summary of H_0

Figure 10 shows the sum of error for each model used in association with the test data for Hypothesis 0 (H_0). This plot does not show any consistency in increases or decreases in error when the human factors variables are removed. The existing differences are also notably small. This observation is confirmed by Figure 11 which shows that the F-Values produced by all of the test data sets which were no where near the critical value of F=3.8 at 95% confidence level or F=2.7 at 90% confidence level. **Therefore, without sufficient evidence, the researcher must fail to reject Hypothesis 0 (H_0: $\mu_T = \mu_{T+H.F.}$) since there is no measurable significant difference between the**

mean error produced by the battle outcome prediction models which use traditional variables and those which use traditional and human factors variables.

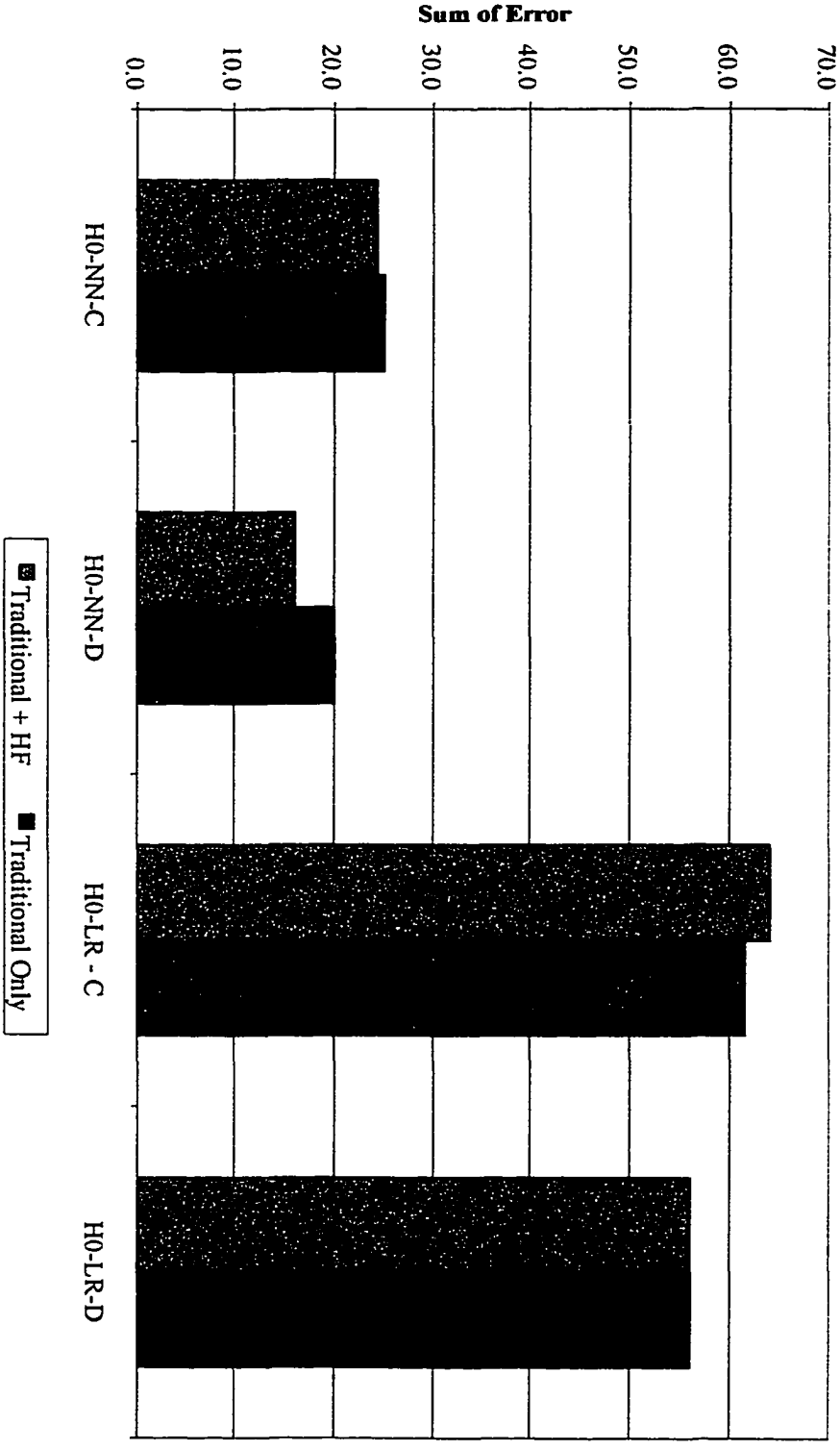

Figure 10: H_0 Error Summary for Test Data

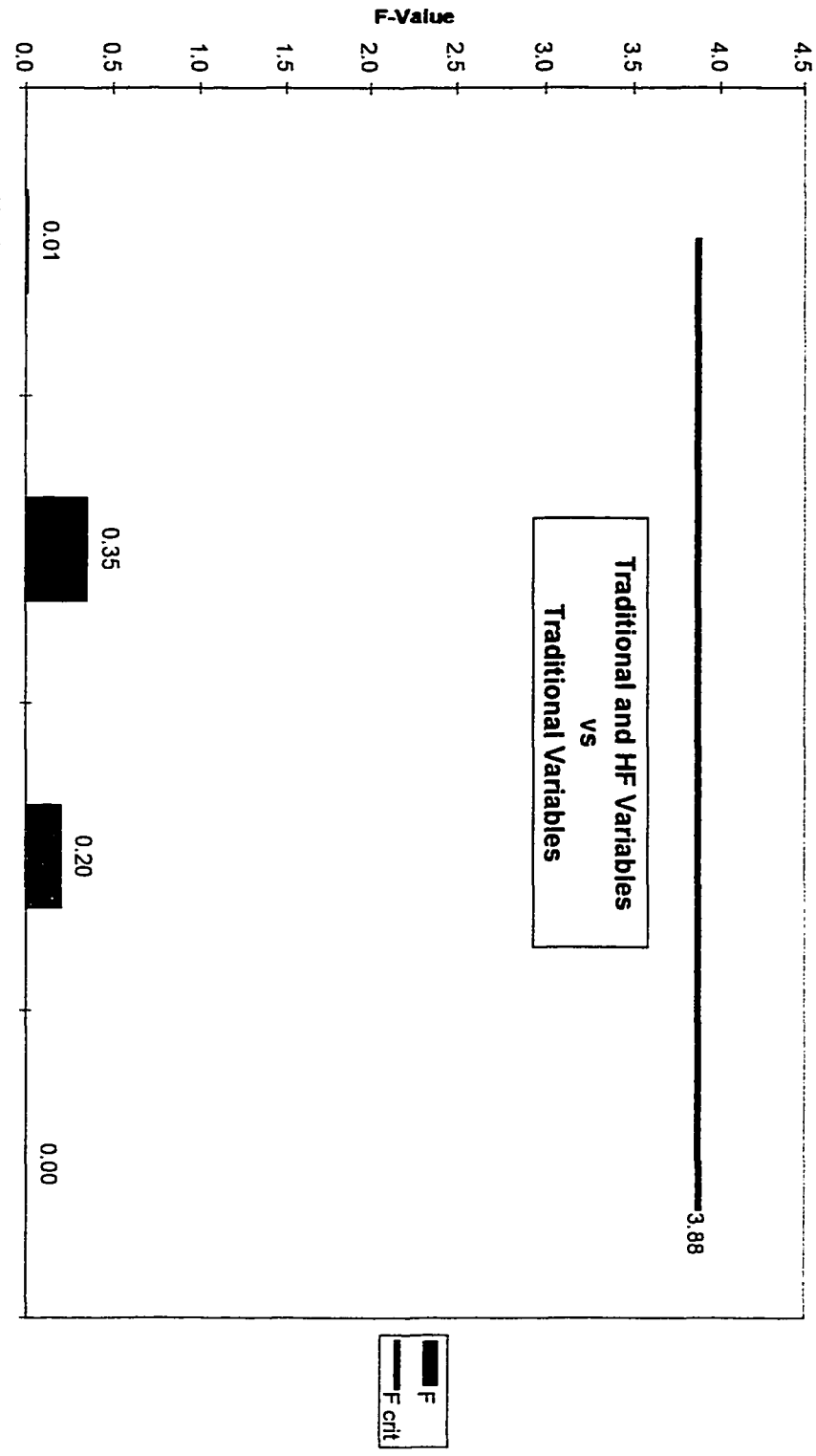

Figure 11: H_0 F Values

Hypothesis 1 (H_1)

Hypothesis 1, H_1 ($\mu_T = \mu_{H.F.}$), examines if there is a significant difference between classical battle outcome predictions which use traditional (non-human factors) data only and battle outcome predictions which use human factors data only. The purpose of this hypothesis was to see if one could accurately predict battle outcomes using human factors data alone. As in H_0, this hypothesis is evaluated using neural network models and linear regression models in both continuous and discrete output formats. The results for each of these four cases are listed in the following section.

H1 for the Neural Network – Continuous Output

Figure 12 shows the scatter plot for H_1 using a neural network with a continuous output. By observation, there is significantly greater error for the case that uses human factors variables than for the case which uses the traditional variables. This is further supported by the ANOVA in Table 6. Error increases from 25 to 63 for the test data when comparing the traditional variables to the human factors variables respectively. Table 6 also shows an F-Value of 25 which is much higher that the critical vale of F=3.88. This clearly indicates traditional data is significantly more accurate in predicting the outcome for this data set using a neural network with a continuous output.

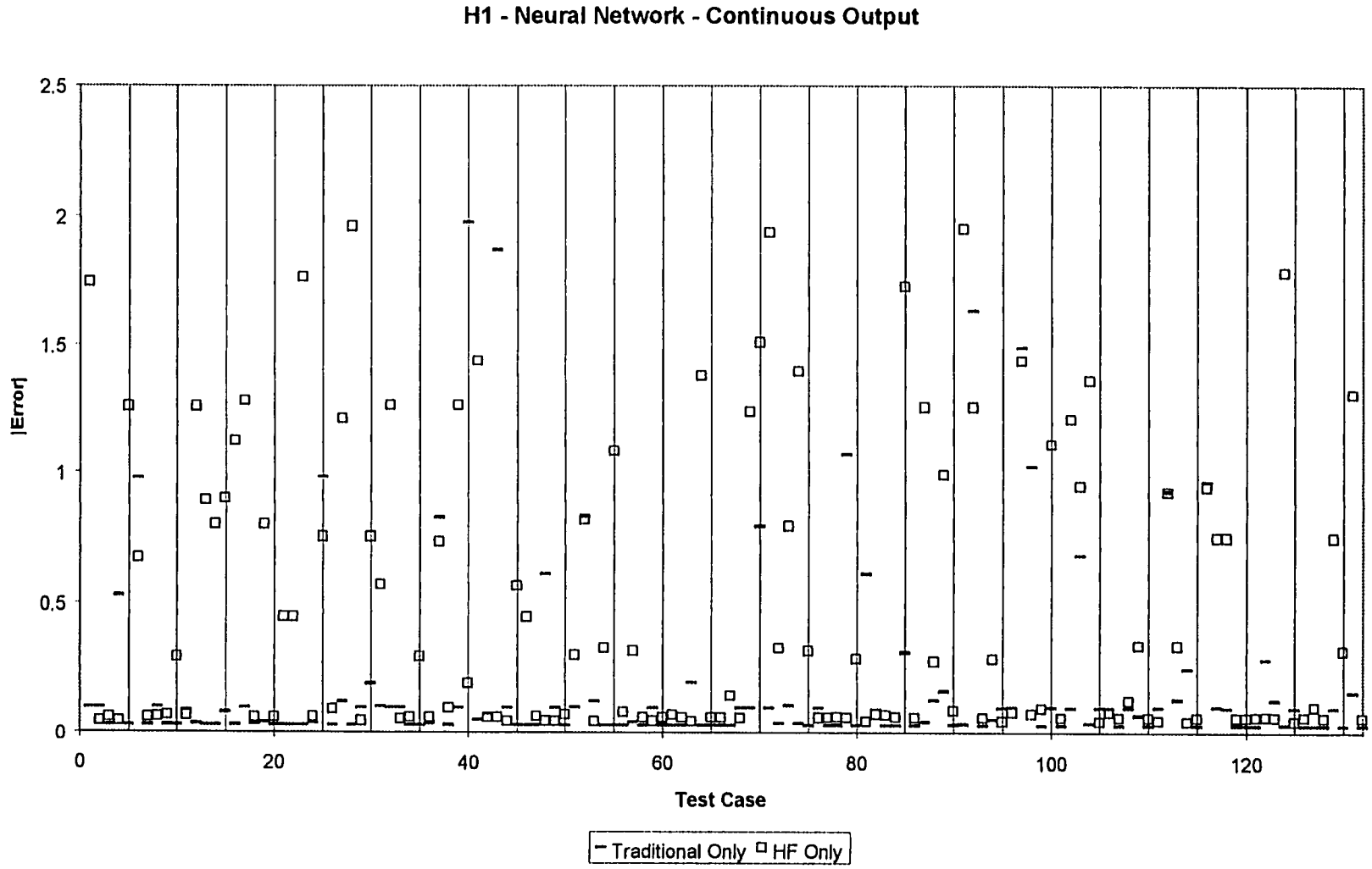

Figure 12: Scatter Plot for H_1 - Neural Network with Continuous Output

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
Traditional Only	132	25.04956335	0.189769419	0.134737566
HF Only	132	63.06371444	0.477755412	0.310656675

ANOVA

Variation	SS	df	MS	F	F crit
Between Groups	5.473771529	1	5.473771529	24.57944459	3.877204335
Within Groups	58.34664552	262	0.22269712		
Total	63.82041705	263			

Table 6: ANOVA for H_1 - Neural Network with Continuous Output

Neural Network –Discrete Output

Figure 1013 shows the scatter plot for H_1 using a Neural Network with a discrete output function for prediction. This scatter plot clearly shows the difference in performance for the two different data sets. There are many errors for the human factors data (Error=52), while the error for the traditional data is small (Error=20).

Further analysis of the error is shown in Table 7. This ANOVA clearly shows that the error increases from 20 to 52 for the independent test set. Also noted is once again a very high value of F = 14 compared to F-Critical of 3.88. It is again observed that the traditional variables produce a significantly more accurate prediction that the human factors variables for this data set using a neural network with a discrete output.

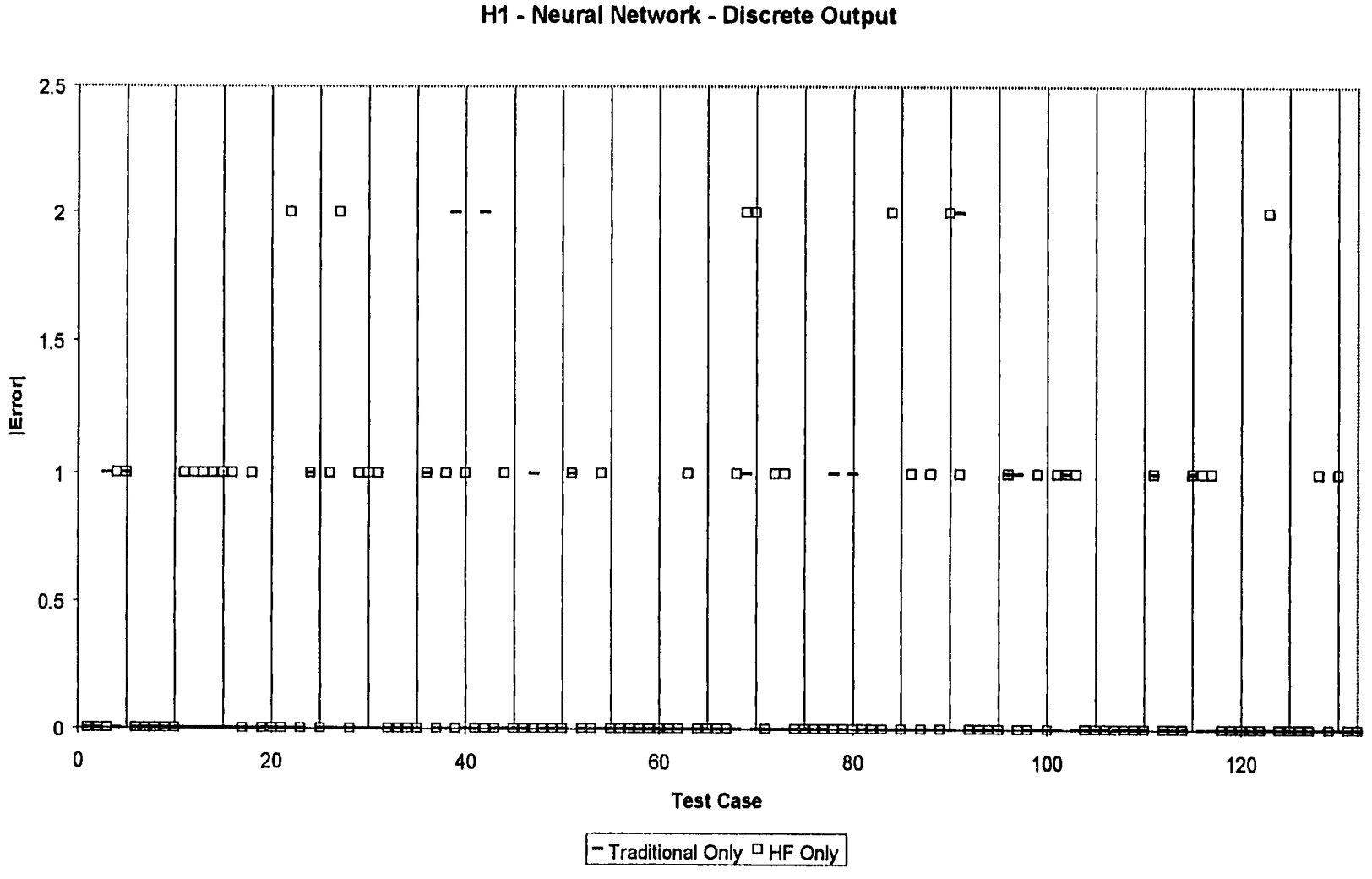

Figure 13: Scatter Plot for H_1 Neural Network with Discrete Output

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional Only	132	20	0.151515152	0.175341198
HF Only	132	52	0.393939394	0.347443905

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	3.878787879	1	3.878787879	14.83893805	3.877204335
Within Groups	68.48484848	262	0.261392551		
Total	72.36363636	263			

Table 7 ANOVA for H_1 for the Neural Network – Discrete Output

Linear Regression – Continuous Output

Figure 1114 shows the scatter plot of H_1 for the linear regression model with a continuous output function. Analysis of this chart shows that there is a significant amount of error for both cases. Table 108 shows the ANOVA for these data sets. The error increases from 61 to 76 for the test data. The ANOVA produces a F-Value of 6, which is greater that the critical value of F=3.88. Therefore there is a significant increase in the prediction ability of the linear regression model that uses traditional variables over the linear regression model that uses human factors variables alone for this data set.

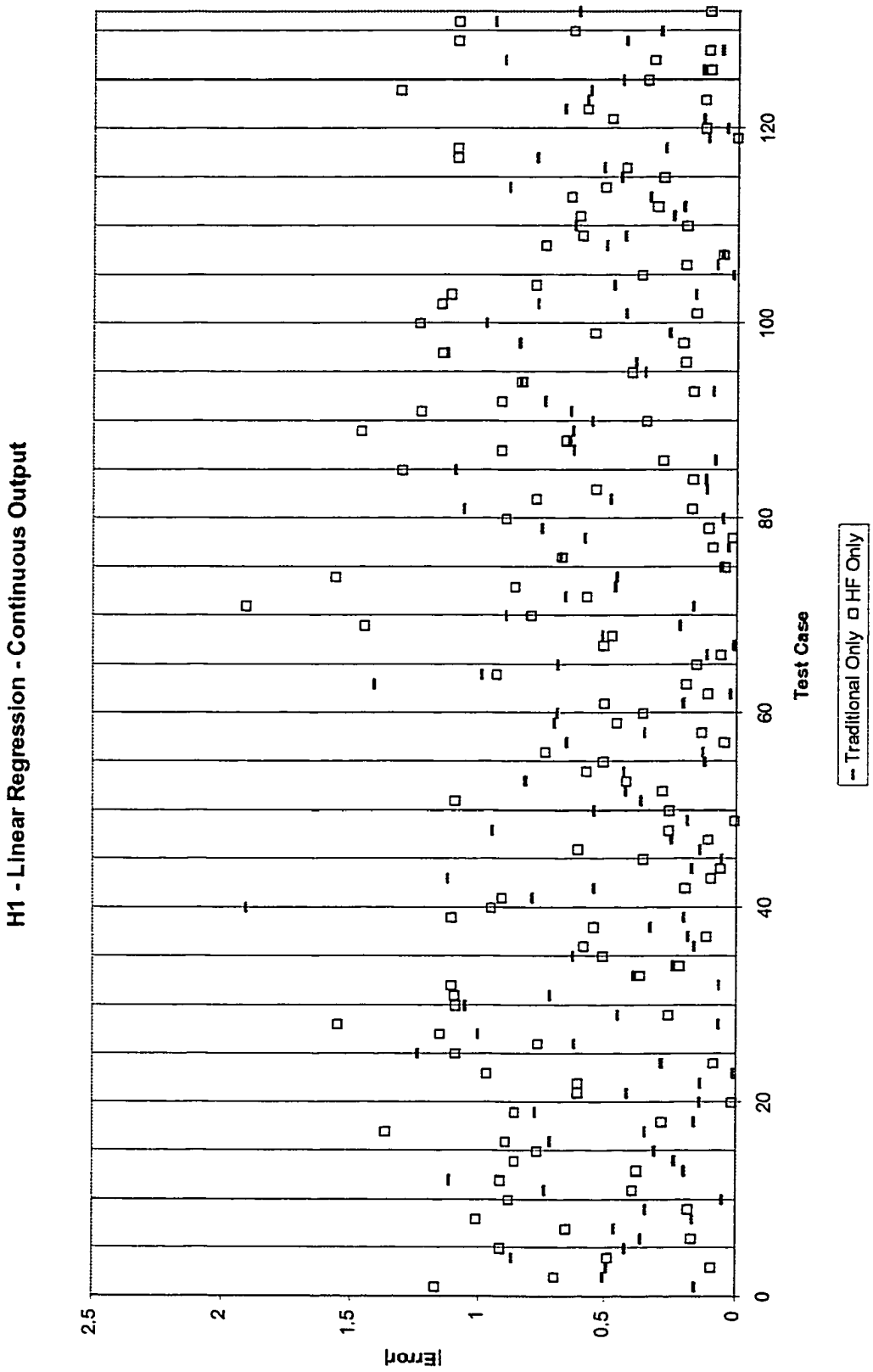

Figure 14: Scatter Plot for H_1 - Linear Regression with Continuous Output

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
Traditional Only	132	61.53216243	0.466152746	0.119085262
HF Only	132	76.94510424	0.582917456	0.178731827

ANOVA

Variation	SS	df	MS	F	F crit
Between Groups	0.899843846	1	0.899843846	6.042929555	3.877204335
Within Groups	39.01403872	262	0.148908545		
Total	39.91388257	263			

Table 8: ANOVA for H_1 - Linear Regression with Continuous Output

Linear Regression – Discrete Output

Figure 15 shows the scatter plot of H_1 for the linear regression model using a discrete output. There is a large amount of observable error in this plot. Table 119 shows the ANOVA of H_1 for the linear regression model using a discrete output function. The error for this case increases from 56 to 73 when comparing traditional variables to the human factors variables. The F-Value produced by this model is 3.9 compared to a critical value of 3.8, this continues to show a significant improvement in accuracy by use of the traditional variables over the human factors variables.

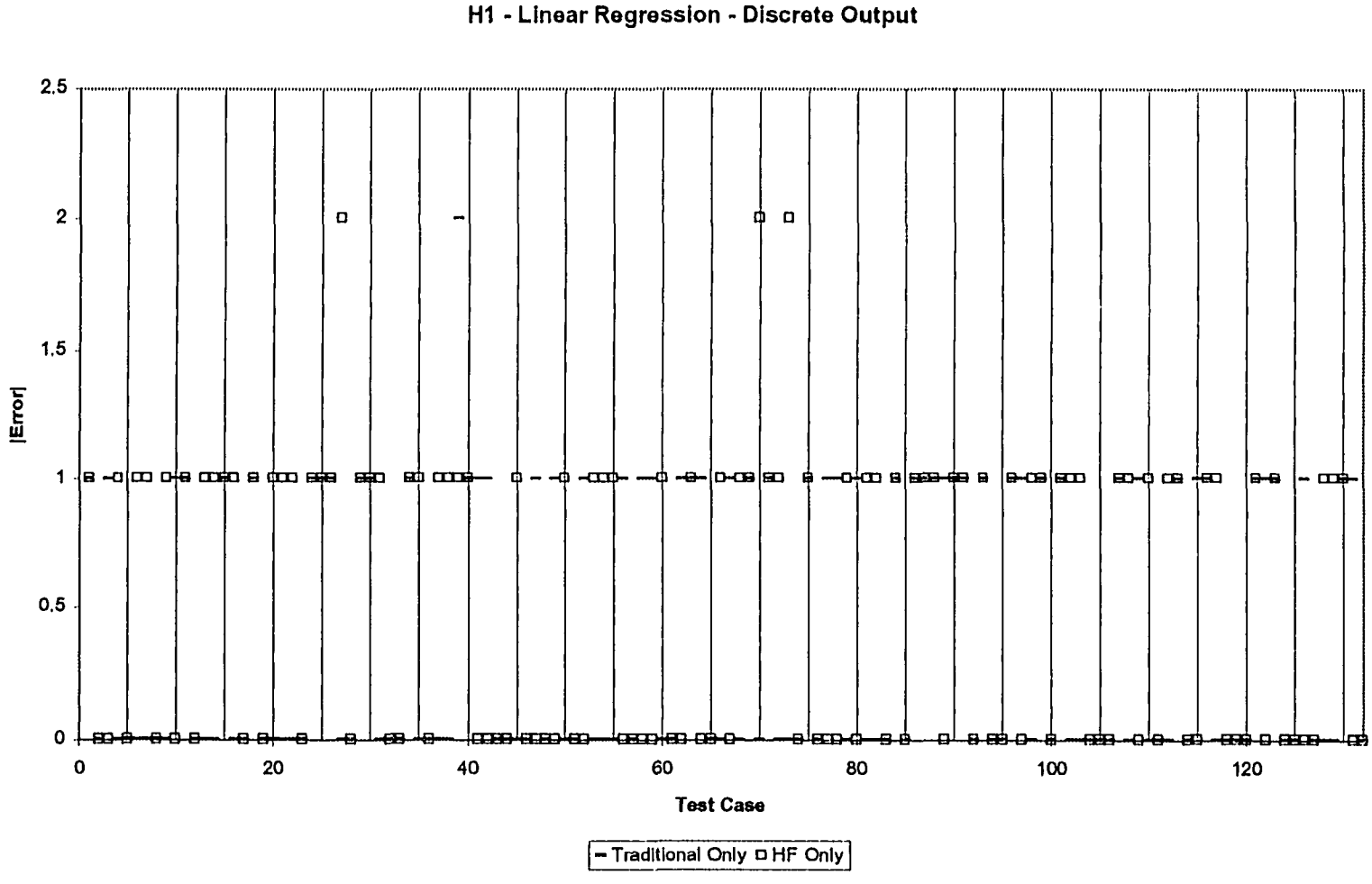

Figure 15: Scatter plot for H_1 - Linear Regression with Discrete Output

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional Only	132	56	0.424242424	0.261392551
HF Only	132	73	0.553030303	0.294876243

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	1.09469697	1	1.09469697	3.935856118	3.877204335
Within Groups	72.87121212	262	0.278134397		
Total	73.96590909	263			

Table 9: ANOVA for H_1 - Linear Regression with Discrete Output

Summary of H_1

Figure 16 shows a summary of the error for the networks used in testing Hypothesis 1 (H_1). There is consistent improvement in error for all cases that use traditional variables over those which use human factors variables. This is supported by the F-Values calculated in the ANOVA for each case as seen in Figure 17. **This leads to the rejection of Hypothesis 1 (H_1: $\mu_T = \mu_{H.F.}$), there is no significant difference between the mean error produced by the battle outcome prediction models which use traditional variables and those which use human factors variables.**

There was a significant improvement shown in prediction error using the traditional variables over the human factors variables using both neural networks and regression networks in a continuous or discrete format. It is also clear that, given a choice of variables to use for a battle prediction model, one would not want to use human factors variables exclusively over the traditional variables.

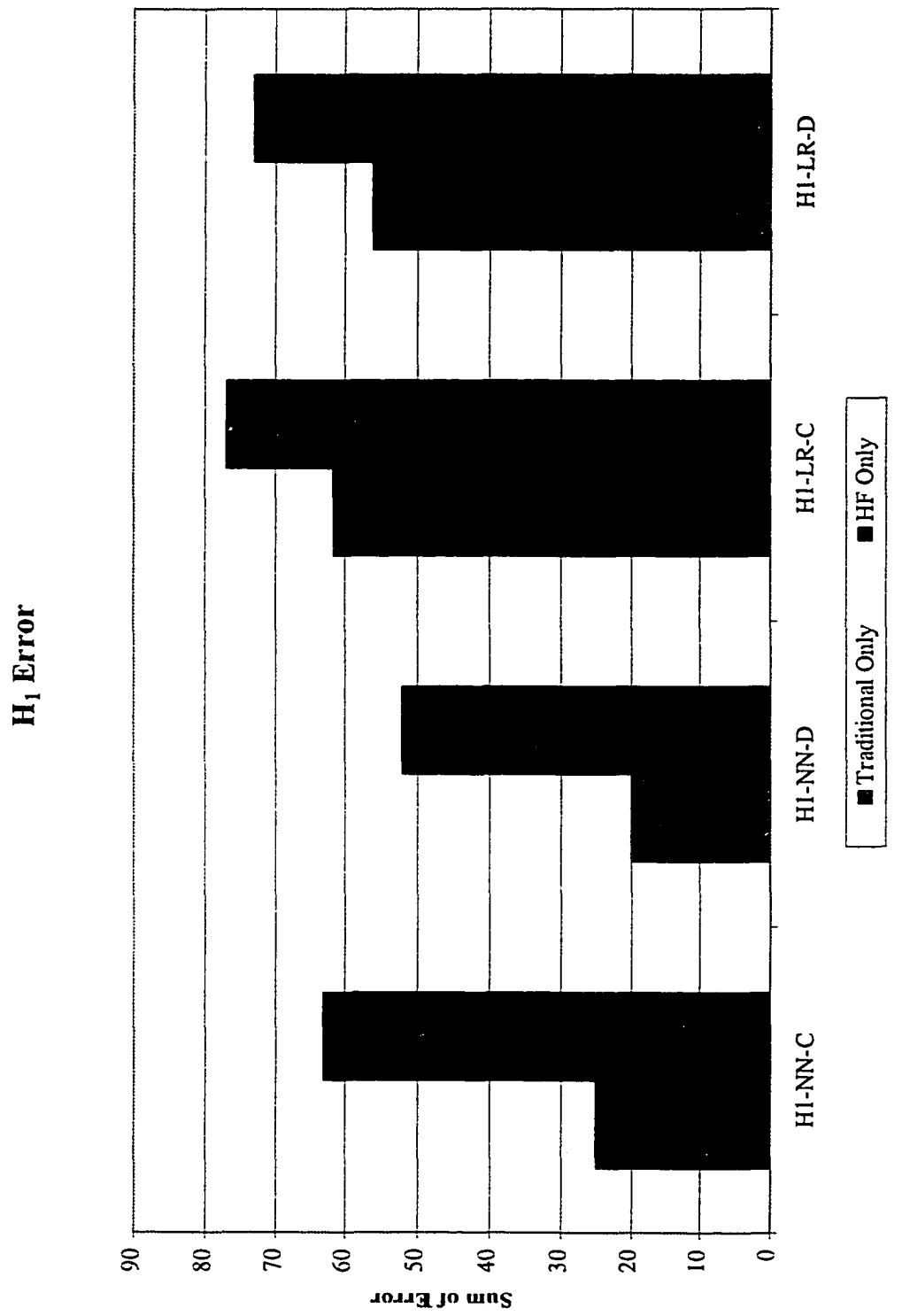

Figure 16: H_1 Error Summary

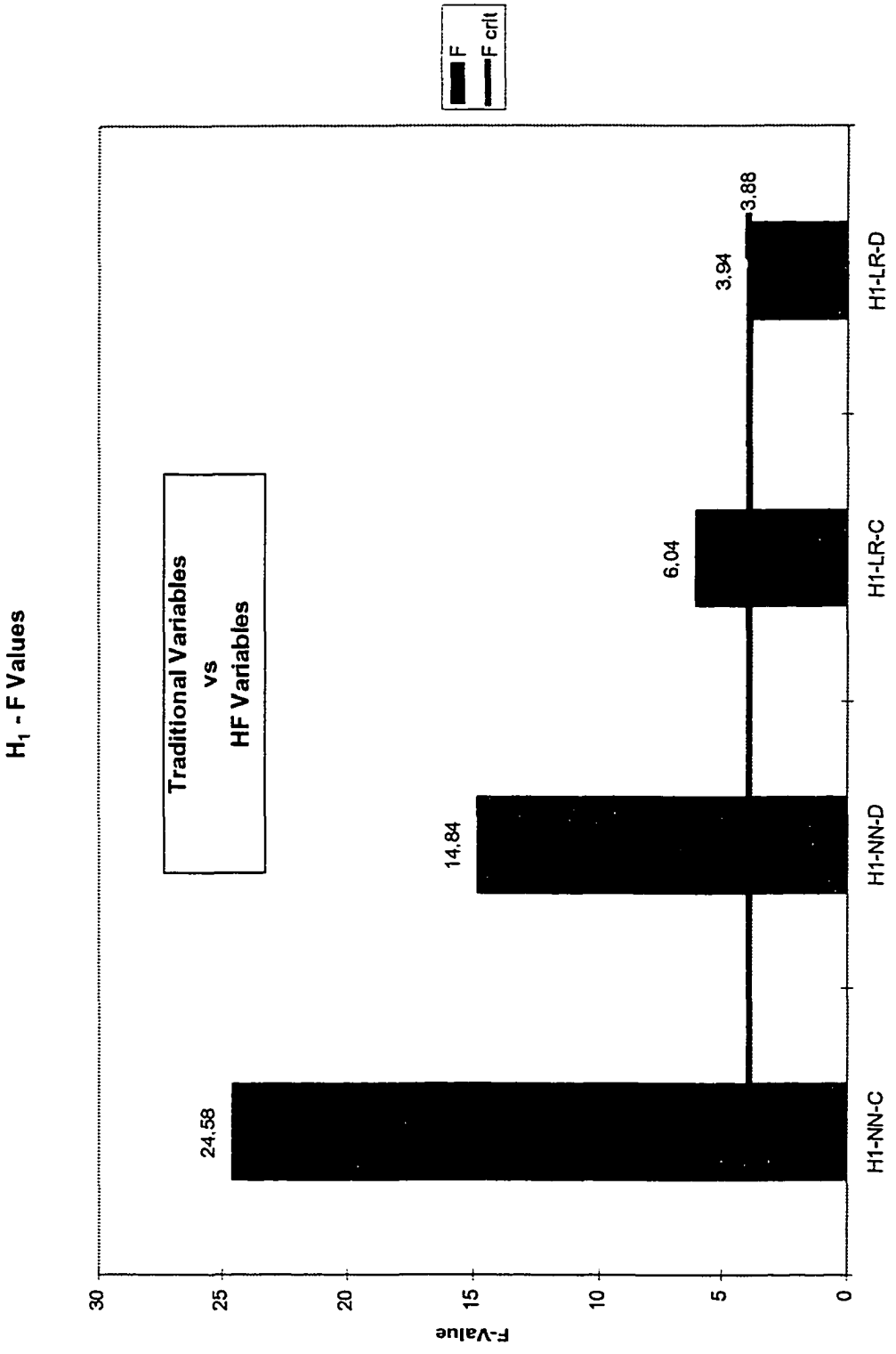

Figure 17: H_1 F Values

Hypothesis 2 (H_2)

Hypothesis 2 (H_2: $\mu_{T+H.F} = \mu_{H.F.}$) explores the difference between battle outcome predictions which use both traditional data and human factors data and battle outcome predictions which use include only human factors data. As in H_0 and H_1, this hypothesis is evaluated using neural network models and linear regression models in both continuous and discrete output formats. The results for each of these four cases are listed in the following section.

Neural Network – Continuous Output

Figure 18 shows the scatter plot for H_2 using a neural network with a continuous output. By observation, it is apparent that the human factors variables alone produced extensively more error than the traditional and human factors data together. This is further supported by the ANOVA in Table 10 where the error increases from 24 to 63 in the independent test data when the traditional and human factors variables are compared to human factors variables alone. The resultant F-Value was 24, which exceeded the critical value of $F = 3.8$. From this, it is concluded that for this case the error produced by the human factors model was significantly greater than the error produced by the traditional and human factors model.

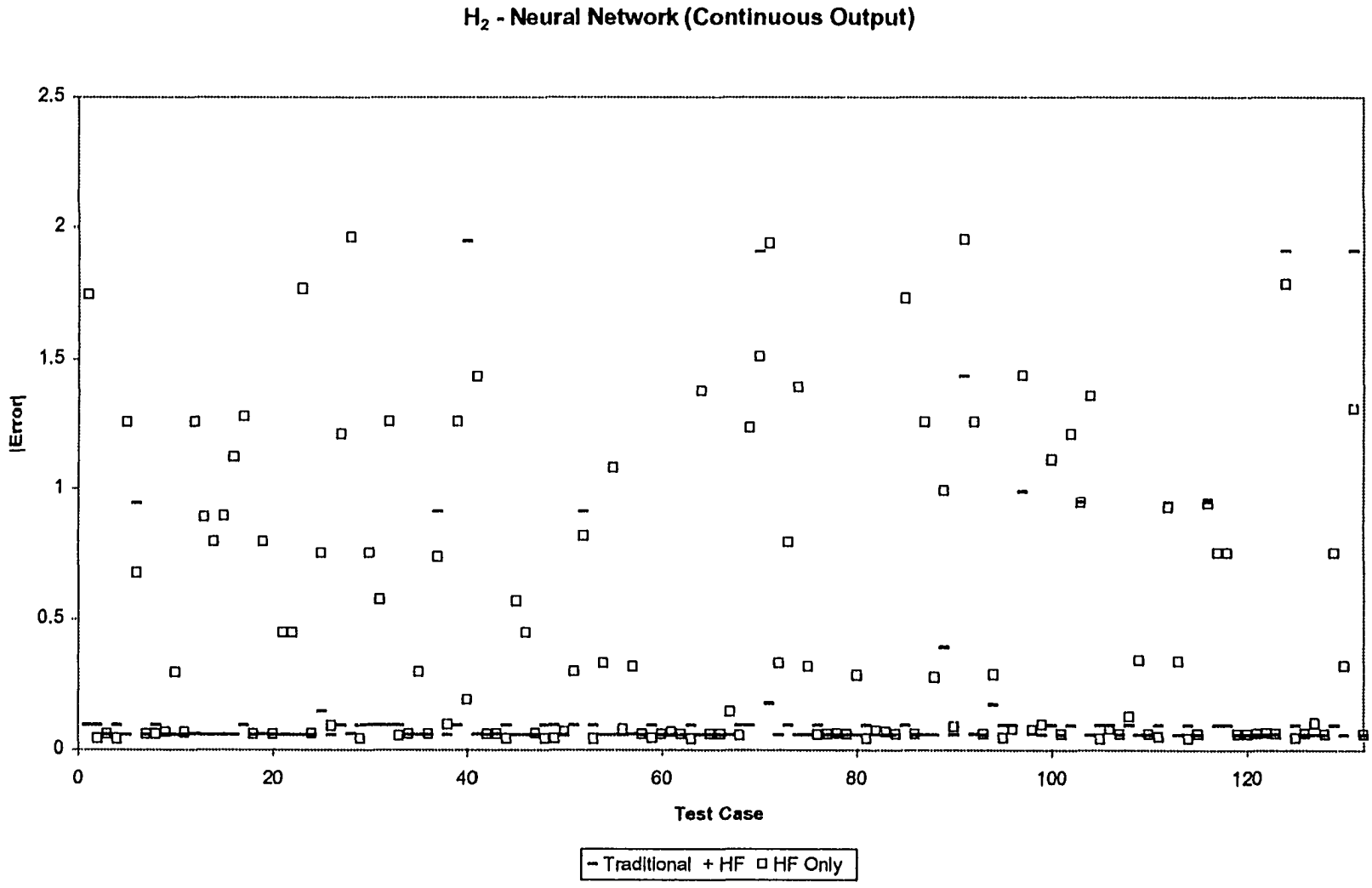

Figure 18: Scatter Plot for H_2 - Neural Network with a Continuous Output

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	24.35095298	0.184476917	0.146726721
HF Only	132	63.06371444	0.477755412	0.310656675

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	5.676810227	1	5.676810227	24.82298342	3.877204335
Within Groups	59.91722488	262	0.228691698		
Total	65.59403511	263			

Table 10 ANOVA for H_2 - Neural Network with Continuous Output

Neural Network –Discrete Output

Figure 19 shows the scatter Plot for H_2 using a neural network with a discrete output. This is similar to the previous experiment and is supported the results from the ANOVA in Table 1311. This also shows results similar to that of the continuous case. The error increases from 16 to 52, producing a F values of 19 which is beyond the critical value of 3.8.

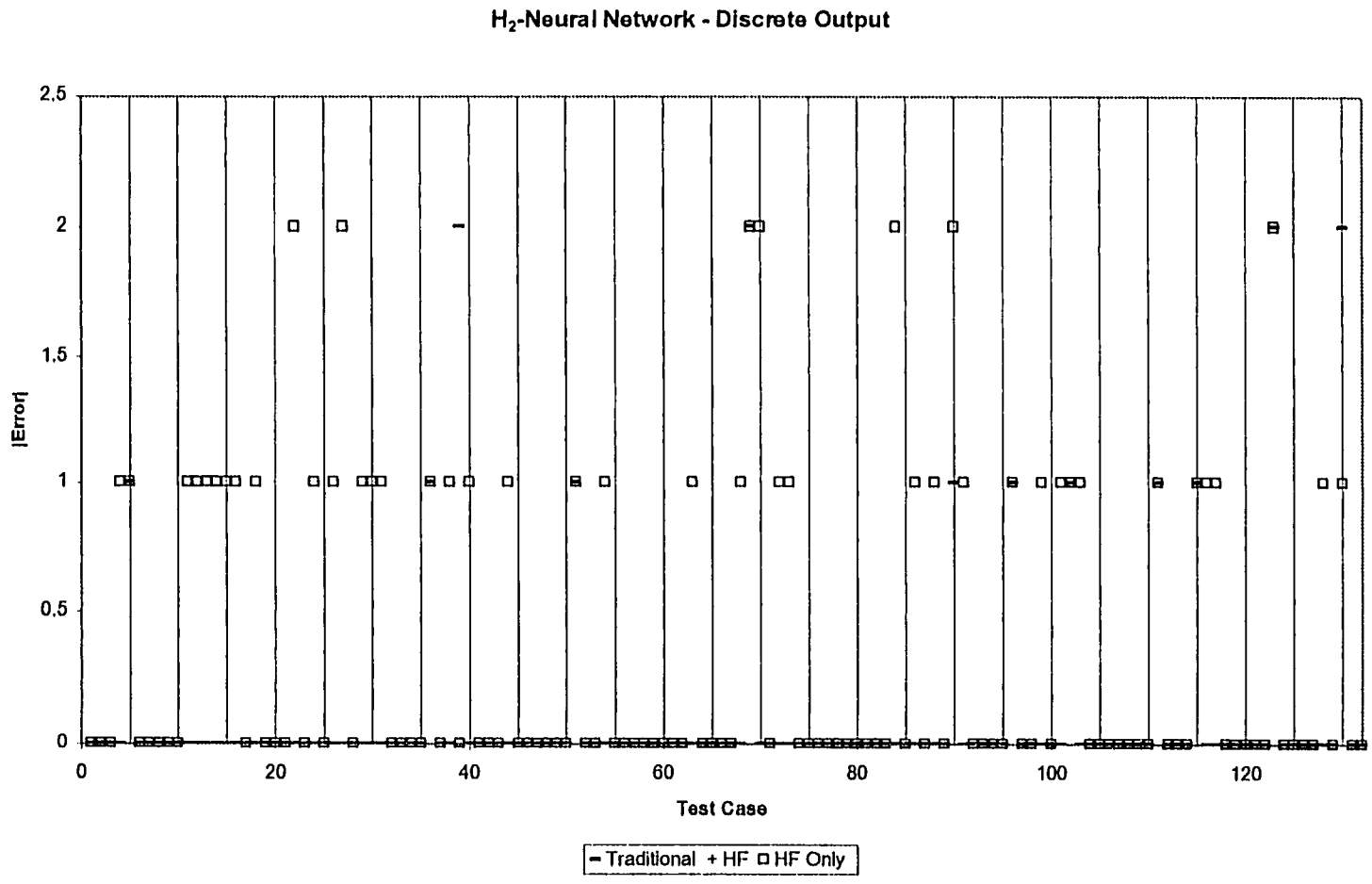

Figure 19: Scatter Plot for H_2 - Neural Network with Discrete Output

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	16	0.121212121	0.168401573
HF Only	132	52	0.393939394	0.347443905

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	4.909090909	1	4.909090909	19.03318386	3.877204335
Within Groups	67.57575758	262	0.257922739		
Total	72.48484848	263			

Table 11: ANOVA for H_2 – Neural Network with Discrete Output

Linear Regression – Continuous Output

Figure 20 shows the scatter plot for H_2 using a linear regression model with a continuous output. By observation, there is not a significant difference between the traditional and human factors variables compared to the human factors variables alone. Both sets of variables appear to be very noisy in this regression network. The ANOVA in Table 12 shows that the error increases from 64 to 76 (difference of 12) when the traditional and human factors variables are compared to the human factors variables alone. The ANOVA produced a F-Value of 4 for this case. It is noted that when comparing this to the neural network model for the same case, that the error values are much higher and the degree of significance is lower when comparing the F values.

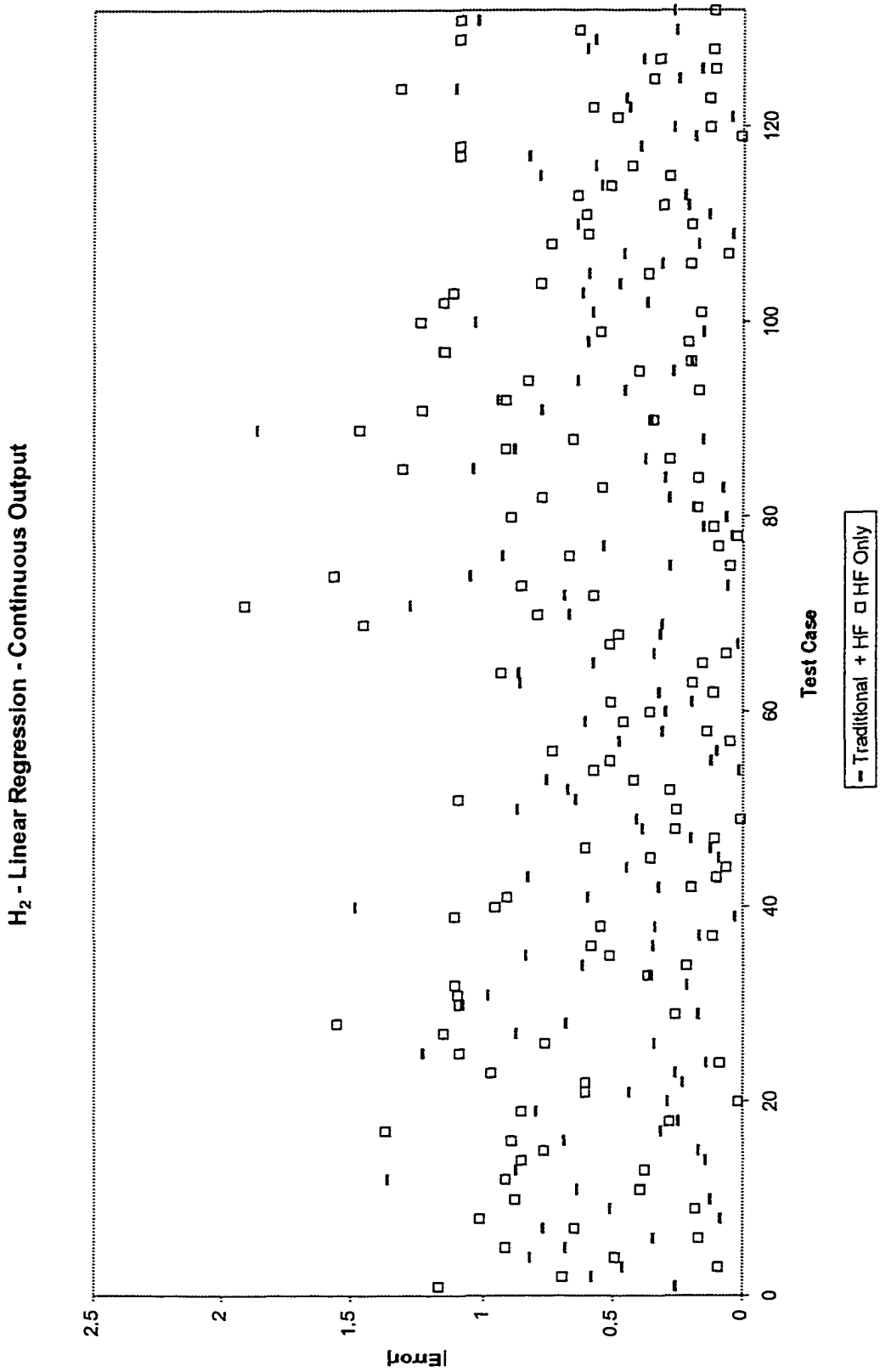

Figure 20: Scatter Plot for H_2 - Linear Regression with Continuous Output

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	64.0679841	0.485363516	0.120755271
HF Only	132	76.94510424	0.582917456	0.178731827

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	0.628106905	1	0.628106905	4.194550682	3.877204335
Within Groups	39.23280983	262	0.149743549		
Total	39.86091674	263			

Table 12: ANOVA for H_2 - Linear Regression with Continuous Output

Linear Regression – Discrete Output

Figure 21 shows the scatter plot for H_2 using a linear regression model with a discrete output. This appears similar to the previous linear regression model. Table 13 shows the ANOVA for H_2 using a linear regression model with a discrete output. This model also shows increases in error from 56 to 73. This data sets produced an F-Value of 3.9, which exceeded the critical value for F. From this it is concluded that there is a significant increase in error when comparing the traditional and human factors data to the human factors data alone when using a linear regression model with a discrete output.

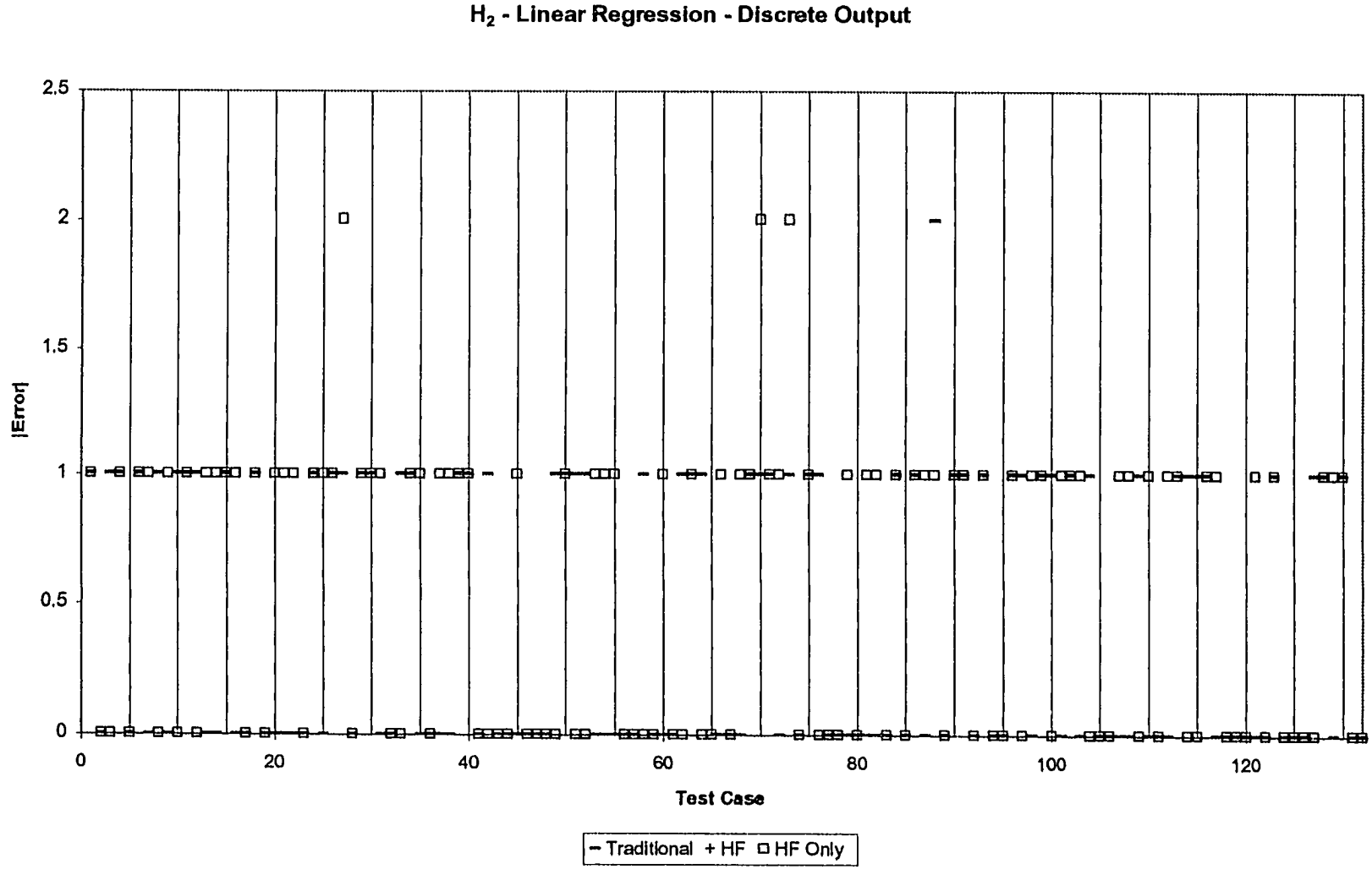

Figure 21: Scatter Plot for H_2 - Linear Regression Model with Discrete Output

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Traditional + HF	132	56	0.424242424	0.261392551
HF Only	132	73	0.553030303	0.294876243

ANOVA

Variation	*SS*	*df*	*MS*	*F*	*F crit*
Between Groups	1.09469697	1	1.09469697	3.935856118	3.877204335
Within Groups	72.87121212	262	0.278134397		
Total	73.96590909	263			

Table 13: ANOVA for H_2 - Linear Regression with Discrete Output

Summary of H_2

Figure 22 shows the error summary for all experiments testing H_2. By observation, there is an increase in error for every case for the models that use human factors variables compared to the models that use traditional and human factors variables. Figure 23 shows the F-Values for all of the experiments associated with H_2. **This leads to the rejection of Hypothesis 2 (H_2: $\mu_{T+H.F} = \mu_{H.F.}$), there is no significant difference between the mean error produced by the battle outcome prediction models which use human factors variables and those which use traditional and human factors variables.**

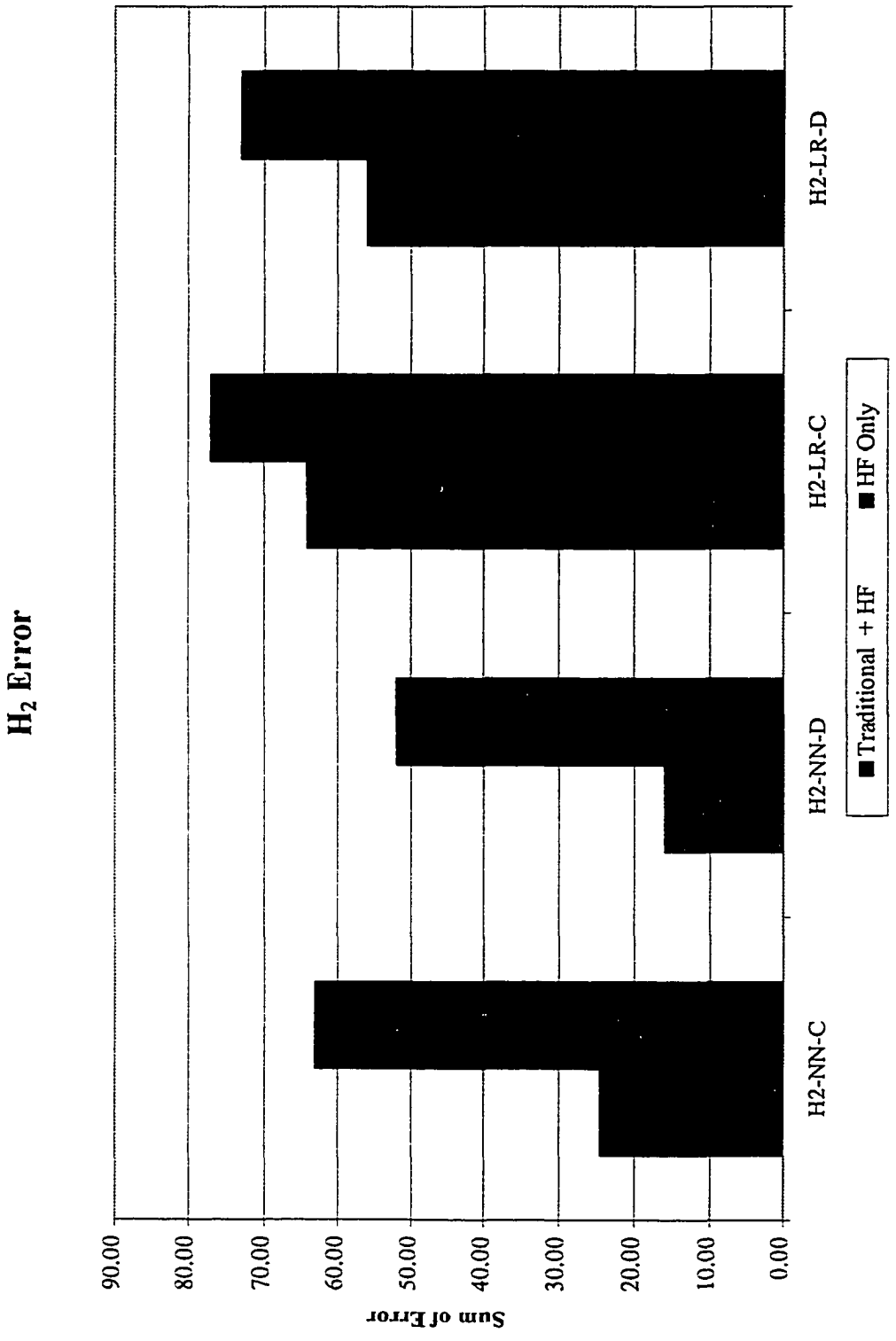

Figure 22: H2 Error Summary

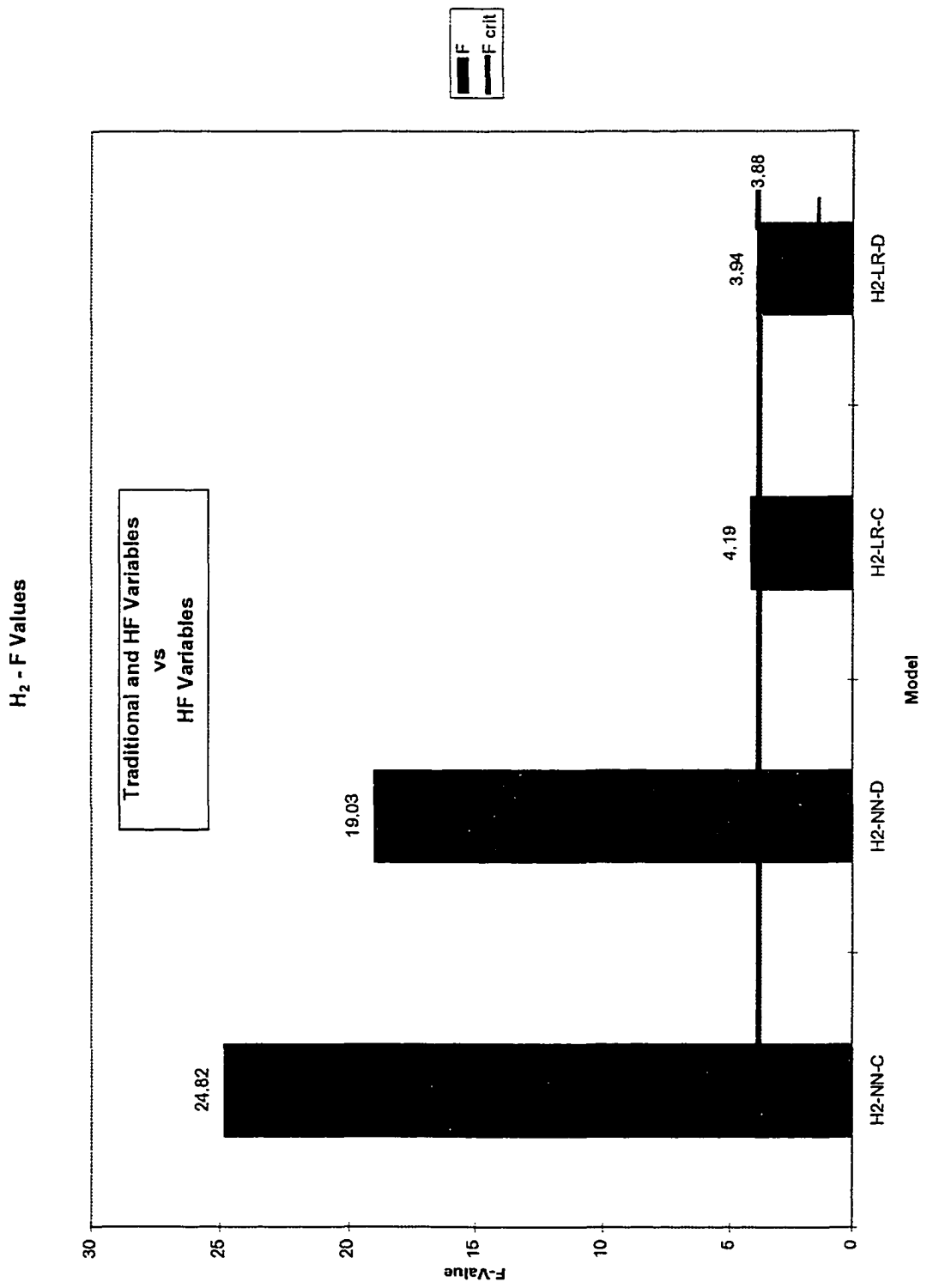

Figure 23: H_2 F Values

It is clear that all cases show a significant difference at the 95% confidence level for this experiment and this data set. Therefore, it is concluded that there is significantly more error produced by these battles prediction models that only use human factors variables as compared to the models which use traditional and human factors variables for these experiments.

Summary of Results

A summary of all results is shown in Table 14. This contains the critical data from the Analysis of Variance for all hypothesis testing for H_0, H_1, and H_2. Figure 24 graphically depicts this summary data. An analysis of the summary of data resulted in an additional observation. The performance of the neural network model compared to the linear regression model for this data set is consistently better. There are visible differences between the error rates for all cases (Testing, Training, Discrete, and Continuous).

Name	Var (SS)	df	MS	F	F crit
H0-NN-C	0.00184870	1	0.00184870	0.01313629	3.87720434
H0-NN-D	0.06060606	1	0.06060606	0.35262450	3.87720434
H0-LR - C	0.02435754	1	0.02435754	0.20311449	3.87720434
H0-LR-D	0.00000000	1	0.00000000	0.00000000	3.87720434
H1-NN-C	5.47377153	1	5.47377153	24.57944459	3.87720434
H1-NN-D	3.87878788	1	3.87878788	14.83893805	3.87720434
H1-LR-C	0.89984385	1	0.89984385	6.04292956	3.87720434
H1-LR-D	1.09469697	1	1.09469697	3.93585612	3.87720434
H2-NN-C	5.67681023	1	5.67681023	24.82298342	3.87720434
H2-NN-D	4.90909091	1	4.90909091	19.03318386	3.87720434
H2-LR-C	0.62810691	1	0.62810691	4.19455068	3.87720434
H2-LR-D	1.09469697	1	1.09469697	3.93585612	3.87720434

Table 14: Summary of Statistics for H_0, H_1, and H2

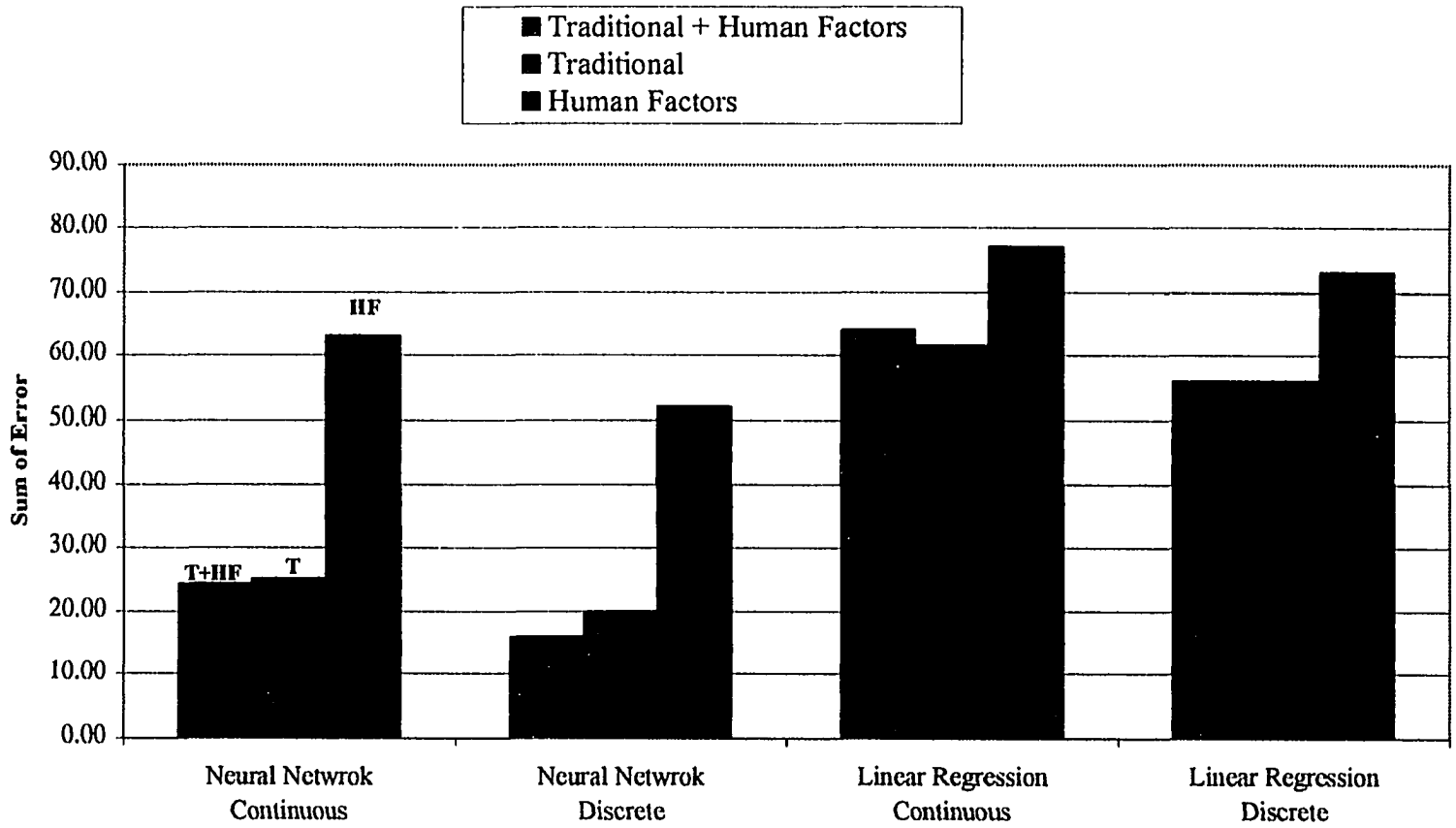

Figure 24: Error Summary

Additional Experimentation

During the course of experimentation, a question regarding the structure of the data sets was considered by the researcher. The data provided by Concepts Analysis Agency had been optimized for use with traditional regression networks. In cases where data was missing from a particular variable, a marker was used to indicate this condition as opposed to leaving it blank. In many cases, a value such as –9 was substituted into the field allowing one to use regression techniques. The neural network used for this experimentation allowed for missing data. To resolve the issue of which data modeling paradigm to use, the researcher chose to run the experiments a second time using the data set with the missing value indicators included. These results form these additional experiment are summarized in Table 15. This data is also summarized graphically in Figure 25. The results of these additional tests support the findings of the original test that did not use data sets with the missing value indicators.

Model Name	Var (SS)	df	MS	F	P-Value	F-Crit
H0-NN-C	0.05727553	1	0.05727553	0.24153018	0.62351457	3.87720434
H0-NN-D	0.09469697	1	0.09469697	0.31566265	0.57470627	3.87720434
H0-LR-C	0.01256135	1	0.01256135	0.08316341	0.77328338	3.87720434
H0-LR-D	0.37878788	1	0.37878788	1.38595006	0.24015858	3.87720434
H1-NN-C	2.82748482	1	2.82748482	10.60475572	0.00127664	3.87720434
H1-NN-D	2.96969697	1	2.96969697	8.42526661	0.00401534	3.87720434
H1-LR-C	0.29287738	1	0.29287738	1.81100263	0.17955138	3.87720434
H1-LR-D	0.54545455	1	0.54545455	1.89549839	0.16975836	3.87720434
H2-NN-C	3.68960989	1	3.68960989	13.20785587	0.00033546	3.87720434
H2-NN-D	4.12500000	1	4.12500000	11.31585627	0.00088341	3.87720434
H2-LR-C	0.17428173	1	0.17428173	1.03437667	0.31007118	3.87720434
H2-LR-D	0.01515152	1	0.01515152	0.04886236	0.82522697	3.87720434

Table 15: Summary of Statistics for H_0, H_1, H_2 using Data Set with Missing Value Indicators

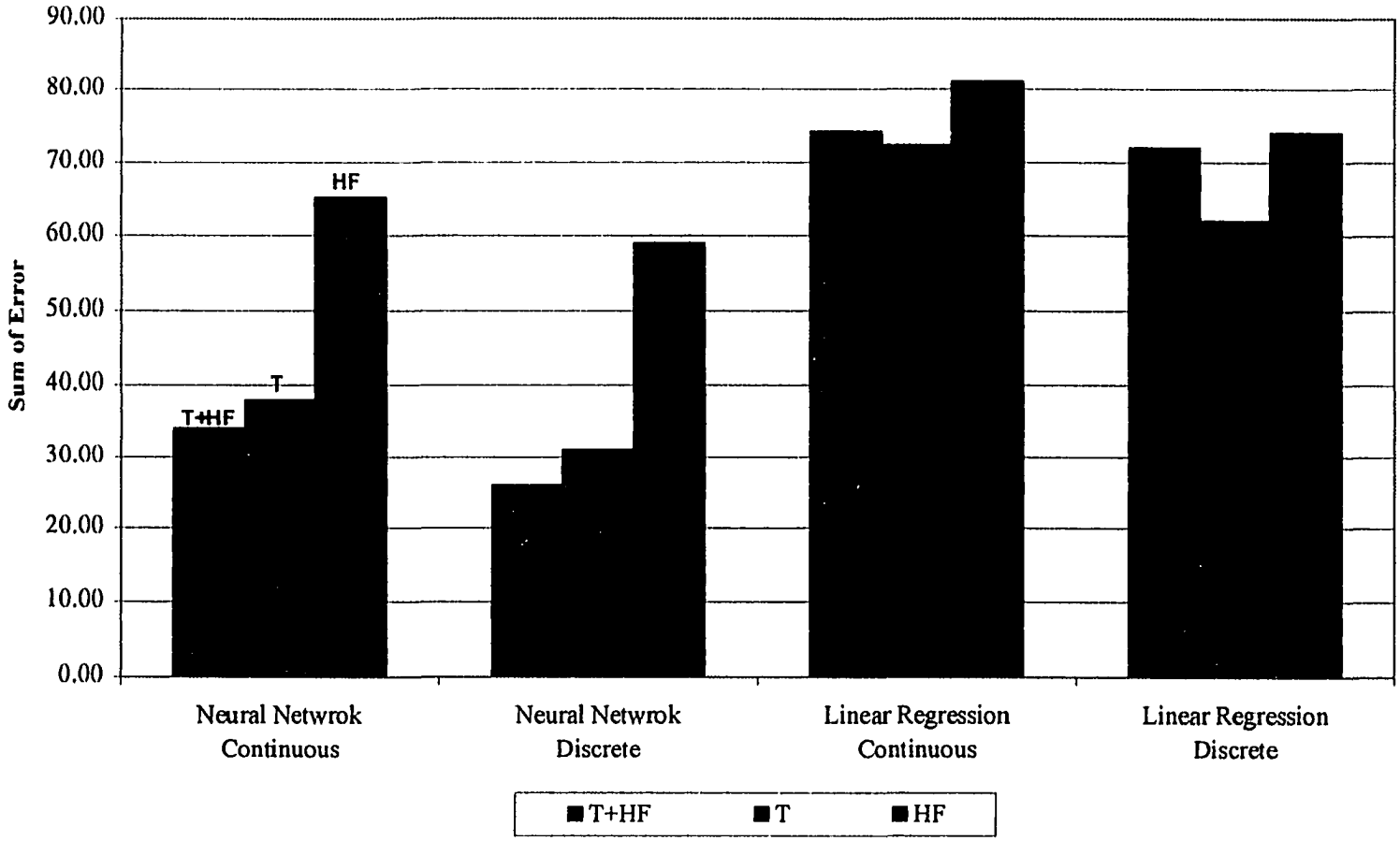

Figure 25: Error Summary using Data Set with Missing Value Indicators

Table 16 shows the F-Values of the data sets that did not use missing data indicators compared to the F-Values of data sets that did use the missing value indicators. The F-Values which are significant are shaded in yellow. As shown in Table 16, there is only difference for these outcomes in terms of significance occurs in the linear regression models for the sub hypothesizes. The linear regression model for these cases was not able to detect a significant difference between the two error rates.

Test	F	(F)
H0-NN-C	0.01313629	0.24153018
H0-NN-D	0.35262450	0.31566265
H0-LR - C	0.20311449	0.08316341
H0-LR-D	0.00000000	1.38595006
H1-NN-C	**24.57944459**	**10.60475572**
H1-NN-D	**14.83893805**	**8.42526661**
H1-LR-C	6.04292956	1.81100263
H1-LR-D	3.93585612	1.89549839
H2-NN-C	**24.82298342**	**13.20785587**
H2-NN-D	**19.03318386**	**11.31585627**
H2-LR-C	4.19455068	1.03437667
H2-LR-D	3.93585612	0.04886236

F Critical = 3.87 ( ) Data w/ Missing Value Indicators

Significant F Values

Table 16: F Value Comparison

A side by side comparison of the two data sets is shown in Figure 26. In the data sets, a slightly higher error can be observed in some of the cases where the missing value indicators are used. However the trends associated with the use or non-use of human factors data remains constant across the tests.

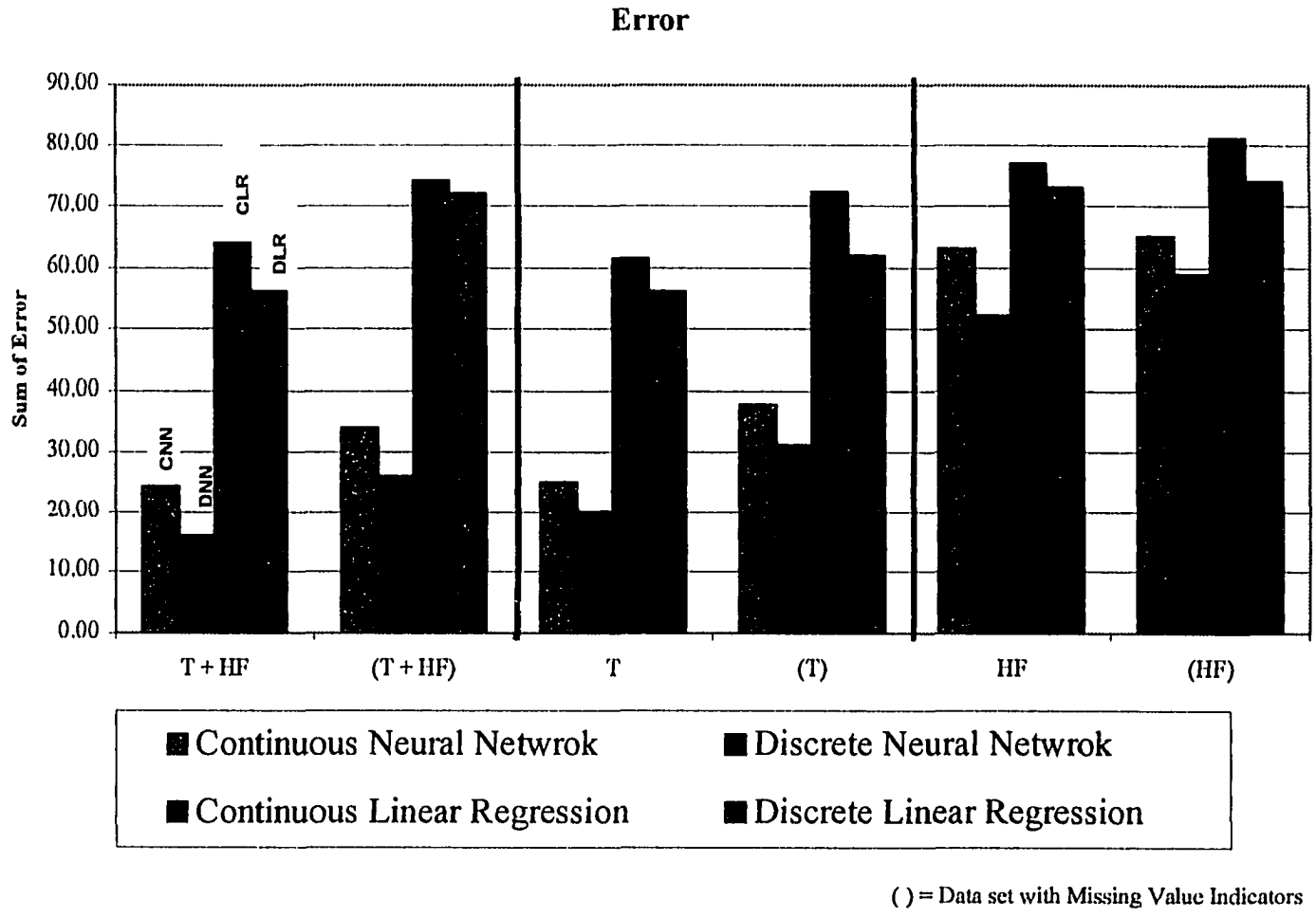

Figure 26: Error in Data Sets with And Without Missing Value Indicators

CHAPTER V

CONCLUSIONS

This section will discuss the conclusions drawn from this research. Figure 27 and Table 17 are used to illustrate the conclusions from the hypothesis testing of H_1, H_2, and H_3.

Hypothesis 0 (H_0)

Figure 27, which shows the error for the test data, does not show any consistent increase or decrease in error when the human factors variables are combined with the traditional variables used for prediction. The differences that are visible are also small. This observation is confirmed by Table 17 which shows that the F-Values (0.01, 0.35, 0.20, 0.00) produced by the data sets did not reach the critical value of F=3.8 at 95% confidence level or even F=2.7 at 90% confidence level. **Therefore, without sufficient evidence, the researcher fails to reject Hypothesis 0 (H_0: $\mu_T = \mu_{T+H.F.}$) since there is no measurable significant difference between the mean error produced by the battle outcome prediction models which use traditional variables and those which use traditional and human factors variables.**

This opposes the suppositions of Dupuy (1977, 1980), Davis and Blumethal (1991), Hedgepeth (1995) and others. It had been previously speculated that these human factors inputs were important to the accuracy of the output produced by the

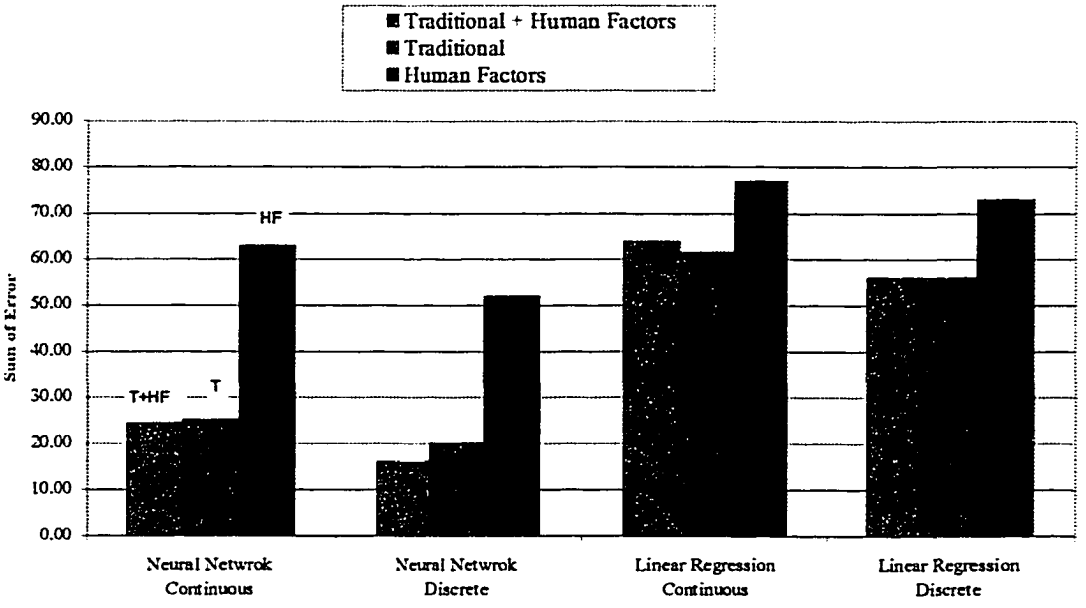

Figure 27: Summary of Error for Hypothesis Testing

H_0				H_1				H_2			
Name	F	F Crit	Sig	Name	F	F Crit	Sig	Name	F	F Crit	Sig
H0-NN-C	0.01	3.88	No	H1-NN-C	24.58	3.88	Yes	H2-NN-C	24.82	3.88	Yes
H0-NN-D	0.35	3.88	No	H1-NN-D	14.84	3.88	Yes	H2-NN-D	19.03	3.88	Yes
H0-LR - C	0.20	3.88	No	H1-LR-C	6.04	3.88	Yes	H2-LR-C	4.19	3.88	Yes
H0-LR-D	0.00	3.88	No	H1-LR-D	3.94	3.88	Yes	H2-LR-D	3.94	3.88	Yes

Table 17: Summary of Results for Hypothesis Testing

prediction models. However there were no experiments performed to test this theory. This experimentation and these data could not show that they have a significant contribution to the output for battle outcome prediction models. The implications from this are:

1. Should the DOD continue to invest resources on the collection of these data if there is no significant difference?
2. If there is more evidence to corroborate these results, then the engineers and scientists responsible for design and implementation of these models should not put effort into methods such as neural networks and genetic algorithms to take advantage of these data if it does not produce a significant difference.

Conceptually most people find it hard to conceive that these human factors do not have a significant impact on the outcome of the battle prediction. To state that variables such as training, leadership, moral, and environmental conditions do not have an impact on human performance and the outcome of a battle is not generally accepted. However, it is clearly demonstrated in this research that adding these selected human factors variables as a direct input to the neural network and linear regression models used for this study did not improve accuracy. The researcher would suggest that even though the human factors do not directly affect the battle outcome prediction models that they could indirectly affect some of the other variables that are also inputs into these models. It is quite easy to conceive that training, moral, and environmental conditions could indirectly affect the number of artillery, air, or personnel losses incurred during a battle and this in turn affects the overall outcome of the battle. The researcher does not offer this as a truism, but only as a possible theory to explain the outcome of this research. One possible area for future research could be to look more closely at how these human factors variables impacts some of the variables which contribute to a victory in battle.

Another area for closer examination is the human factors datum itself. As previously stated, even though the data set was the best available, the human factors variables were still very generalized in nature. Also the researcher was forced to use external variables that impact human performance, as opposed to using behavioral human factors variables which do not exist at this time. Perhaps with better data available, these human factors could have a more significant impact on the battle outcome prediction.

This result suggests some other implications to the modeling and simulation researchers and practitioners. One can assume that if these results are not significantly different by the inclusion of these variables for the battle outcome prediction model, that there may not clearly exist a possibility for improvement in other similar prediction scenarios with similar data sets. The cost of collecting data, developing new methods, and using new algorithms is costly for any case, especially when the data are highly subjective. However if researchers are going to pursue the use of human factors data, then better data sets must be constructed.

Hypothesis 1 (H_1)

Figure 27 also shows a summary of the error for the networks used in testing Hypothesis 1 (H_1). There is consistent improvement in error for all cases that use traditional variables over those which use human factors variables alone. This is supported by the F-Values calculated in the ANOVA for each case as seen in Table 17. **This leads to the rejection of Hypothesis 1 (H_1: $\mu_T = \mu_{H.F.}$), there is no significant difference between the mean error produced by the battle outcome prediction models which use traditional variables and those which use human factors variables.**

There was a significant improvement shown in prediction error using the traditional variables over the human factors variables using both neural networks and regression networks in a continuous or discrete format. It is also clear that, given a mutually exclusive choice of variables to use for a battle prediction model, one would not want to use human factors variables over the traditional variables.

Hypothesis 2 (H_2)

Figure 27 shows the error for the testing data. As expected from H_0 and H_1, there is an increased error in every case for the models that use human factors variables compared to the models that use traditional and human factors variables. Table 17 shows the F-Values for all of the experiments associated with the testing data for H_2. **This leads to the rejection of Hypothesis 2 (H_2: $\mu_{T+H.F} = \mu_{H.F.}$), there is no significant difference between the mean error produced by the battle outcome prediction models which use human factors variables and those which use traditional and human factors variables.**

It is clear that all cases show a significant difference at the 95% confidence level for this experiment and these data. Therefore it is concluded that there is significantly more error produced by these battle prediction models which only use human factors variables as compared to the models which use traditional and human factors variables.

Additional Conclusions

Besides the hypotheses tested during this experimentation, there were two other variations of the models examined during the research. These variations included: the use of a continuous model output and a discrete model output; and the use of data sets with and without missing data indicators. It was observed that while using any of these

variations in the modeling scheme may have induced some changes in the error at an aggregate level, but the relationships between the individual models were not changed.

Summary of Conclusions

In regards to battle outcome prediction, this research was unable to show that the addition of human factors variables produced any significant change in the output of the neural networks or regression models utilized during these experiments. This is attributable to one or more of several factors. These included a) human factors variables are not significant in regards to battle outcome predictions, b) the models that are currently used are not sufficient to take advantage of their significance, or c) the variables selected as human factors variables are not the correct ones to produce a significant difference. Another highly significant conclusion provided by this research is the lack of behavioral human factors data available for use in battle simulation. To solve the problem surrounding the lack of data, it is recommended that researchers look closely at the definitions of human factors as it relates to battle simulation and derive more accurate (behavioral) human factors variables with metrics that are quantifiable. What ever the cause for the lack of significance may be, this research did not show a significant improvement in prediction capability by the models which included human factors variables over those that did not include human factors.

Limitations of the Research

The results of this research are limited to the data sets used by the researcher and the models used for experimentation in conjunction with this data set. As stated above, this is attributable to one or more of several factors. These included a) human factors variables are not significant in regards to battle outcome predictions, b) the models that

are currently used are not sufficient to take advantage of their significance, or c) the variables selected as human factors variables are not the correct ones to produce a significant difference.

As previously stated, another limitation to this research was imposed by the availability of data on the human factors associated with battles. The human factors variables used were divided into two groups. The first group was directly applicable to our definition of human factors, but they were very general in nature. The second group contained variables that may directly or indirectly impact human performance. More precise or descriptive human factors variables could possible contribute to better application in a modeling and simulation environment. Even though the database provided by Concepts Analysis Agency was the best source available to the researcher, there is still a need for better human factors data in this area of research. With an expanded and more explicit human factors database one may be able to begin to develop models that can use the factors more effectively. Until that time, the research is constrained by the available data.

Contributions

This research provides a contribution to the literature and communities of interest for researchers of human factors, modeling and simulation, and in particular, battle simulation. For the human factors community, this research provides information regarding human factors significance in battle simulations and prediction scenarios. It also shows the affects of using human factors with linear regression models and neural network models. This is also applicable to the modeling and simulation community, and directly to the battle outcome prediction community. The direct contribution to the battle

simulation community is the results regarding the suspected significance of human factors variables in battle outcome prediction.

Future Research

One possible area for future research may be related to the outcome of the first hypothesis test, which showed that human factors were not directly significant in regards to the accuracy of the prediction model. One could more closely examine how these human factors variables impact some of the variables which do significantly contribute to a victory in battle. This could provide insight into the battle process and relationships.

This research looked at two methods for prediction of battle outcomes. The methods used were regression algorithms and neural networks. While these two methods were effective for this experiment, one may wish to continue this research using logistical regression networks, genetic algorithms, and hybrid networks. The benefits of this could be applicable to both battle prediction and to determination of the significance of input variables. It was observed in this research that the neural network models had lower error rates than the linear regression models. It would be interesting to further compare this to logistical, genetic, and hybrid models.

Another recommendation for future research is in the area of human factors. The need for more behavioral human factors data as it is related to battle outcome prediction is evident after completing this research. The researcher for this study recommends looking closely at human factors definitions and how they are applicable in the battle environment. Once this is done, more direct human factors variables with quantifiable metrics could be used in battle simulations to possibly improve prediction capability.

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APPENDIXES

APPENDIX A

DEFINITION OF VARIABLES

This Appendix provides the definitions of the variables used in the US Army Concepts Analysis Agency database. The definitions were provided by CAA. For more information or inquiries, please use the following CAA point of Contact:

US Army Concepts Analysis Agency
ATTN: CSCA-MVM (Helmbold)
8120 Woodmont Avenue
Bethesda, MD 20814-2797

Variable Definition

COLUMN HEADING, ABBREVIATION	COLUMN CONTENTS, DESCRIPTION	SHORT NOTES
ISEQNO	BATTLE SEQUENCE (LINE OR SERIAL) NUMBER	ARBITRARY INDEX,
WAR NAME, WAR	WAR IN WHICH BATTLE/ENGAGEMENT WAS FOUGHT	
ENGAGEMENT NAME, NAME	NAME OF THE BATTLE/ENGAGEMENT	
LOCATION, LOCN	LOCATION WHERE BATTLE WAS FOUGHT	COUNTRY OR REGION.
CAMPAIGN, CAMPGN	CAMPAIGN IN WHICH BATTLE WAS FOUGHT	
ATTACKING FORCE NAME, NAMA	DESIGNATION OF THE ATTACKING FORCES	
ATTACKING FORCE CDR, COA	NAME OF THE ATTACKING FORCE COMMANDER	
DEFENDING FORCE NAME, NAMD	DESIGNATION OF THE DEFENDING FORCES	
DEFENDING FORCE CDR, COD	NAME OF THE DEFENDING FORCE COMMANDER	
1ST WIDTH FRONT ATK, WOFA1	ATTACKER'S WIDTH OF FRONT AT START OF BATTLE	IN KILOMETERS,
1ST WIDTH FRONT DEF, WOFD1	DEFENDER'S WIDTH OF FRONT AT START OF BATTLE	IN KILOMETERS,
1ST YEAR, YR1	TIME FIRST WIDTHS OF FRONT BECAME EFFECTIVE	YEAR,
1ST MONTH, MO1	"	MONTH-NUMBER,
1ST DAY, DA1	"	DAY OF MONTH,
1ST HOUR, HR1	"	24-HOUR MILITARY CLOCK,
2ND WIDTH FRONT ATK, WOFA2	ATTACKER'S SECOND WIDTH OF FRONT	IN KILOMETERS,
2ND WIDTH FRONT DEF, WOFD2	DEFENDER'S SECOND WIDTH OF FRONT	IN KILOMETERS,
2ND YEAR, YR2	TIME SECOND WIDTHS OF FRONT BECAME EFFECTIVE	YEAR,
2ND MONTH, MO2	"	MONTH-NUMBER,
2ND DAY, DA2	"	DAY OF MONTH,
2ND HOUR, HR2	"	24-HOUR MILITARY CLOCK,
3RD WIDTH FRONT ATK, WOFA3	ATTACKER'S THIRD WIDTH OF FRONT	IN KILOMETERS,
3RD WIDTH FRONT DEF, WOFD3	DEFENDER'S THIRD WIDTH OF FRONT	IN KILOMETERS,
3RD YEAR, YR3	TIME THIRD WIDTHS OF FRONT BECAME EFFECTIVE	YEAR,
3RD MONTH, MO3	"	MONTH-NUMBER,
3RD DAY, DA3	"	DAY OF MONTH,
3RD HOUR, HR3	"	24-HOUR MILITARY CLOCK,
POSTYPE	DEFENDER'S POSTURE TYPE DESCRIPTOR	CODED AS 0, 1, 2, OR 9,

Variable Definition

COLUMN HEADING, ABBREVIATION	COLUMN CONTENTS, DESCRIPTION	SHORT NOTES
POST1	DEFENDER'S PRIMARY DEFENSIVE POSTURE	SEE NOTE 2.
POST2	DEFENDER'S SECONDARY POSTURE	SEE NOTE 2.
FRONT	DID DEFENDER'S POSTURE CHANGE ALONG THE FRONT?	0=NO, 1=YES, 9=UNKNOWN.
DEPTH	DID DEFENDER'S POSTURE CHANGE WITH DEPTH?	0=NO, 1=YES, 9=UNKNOWN.
TIME	DID DEFENDER'S POSTURE CHANGE OVER TIME?	0=NO, 1=YES, 9=UNKNOWN.
TERRA1	PRIMARY LOCAL TERRAIN DESCRIPTION	SEE NOTE 3.
TERRA2	SECONDARY LOCAL TERRAIN DESCRIPTION	SEE NOTE 3.
WX1	PRIMARY LOCAL WEATHER DESCRIPTION	SEE NOTE 4.
WX2	SECONDARY LOCAL WEATHER DESCRIPTION	SEE NOTE 4.
WX3	TERTIARY LOCAL WEATHER DESCRIPTION	SEE NOTE 4.
SURPA	RELATIVE SURPRISE ACHEIVED BY ATTACKER	ON SCALE OF -3 TO +3, OR 9,
AEROA	ATTACKER'S RELATIVE AIR SUPERIORITY IN THEATER	ON SCALE OF -1 TO +1, OR 9,
TOTAL PERS STR ATK, STRA	ATTACKER'S TOTAL PERSONNEL STRENGTH	-1 IF NOT AVAILABLE,
CODE A	INDICATES INTERPRETATION OF TOTAL PERS STR, ATK	CODED AS 1, 2, OR 3,
INIT PERS STR ATK, INTSTA	ATTACKER'S INITIAL PERSONNEL STRENGTH	-1 IF NOT AVAILABLE.
PERS REINF & REPL ATK, RERPA	ATTACKER'S PERSONNEL REINF/REPL DURING BATTLE	-1 IF NOT AVAILABLE.
PERS CAS ATK, CASA	ATTACKER'S PERSONNEL BATTLE CASUALTIES	-1 IF NOT AVAILABLE.
FINAL PERS STR ATK, FINSTA	ATTACKER'S PERSONNEL STRENGTH AT BATTLE'S END	-1 IF NOT AVAILABLE.
TOTAL PERS STR DEF, STRD	DEFENDER'S TOTAL PERSONNEL STRENGTH	-1 IF NOT AVAILABLE,
CODE D	INDICATES INTERPRETATION OF TOTAL PERS STR, DEF	CODED AS 1, 2, OR 3,
INIT PERS STR DEF, INTSTD	DEFENDER'S INITIAL PERSONNEL STRENGTH	-1 IF NOT AVAILABLE.
PERS REINF & REPL DEF, RERPD	DEFENDER'S PERSONNEL REINF/REPL DURING BATTLE	-1 IF NOT AVAILABLE.
PERS CAS DEF, CASD	DEFENDER'S PERSONNEL BATTLE CASUALTIES	-1 IF NOT AVAILABLE.
FINAL PERS STR DEF, FINSTD	DEFENDER'S PERSONNEL STRENGTH AT BATTLE'S END	-1 IF NOT AVAILABLE.
HORSE CAV ATK, CAVA	ATTACKER'S HORSE CAVALRY STRENGTH	-1 IF NOT AVAILABLE.
TOT TANK ATK, TANKA	ATTACKER'S TOTAL NUMBER OF TANKS	-1 IF NOT AVAILABLE.
LITE TANK ATK, LTA	ATTACKER'S NUMBER OF LIGHT TANKS	-1 IF NOT AVAILABLE.
MAIN BTTL TANK ATK, MBTA	ATTACKER'S NUMBER OF MAIN BATTLE TANKS	-1 IF NOT AVAILABLE.

Variable Definition

COLUMN HEADING, ABBREVIATION	COLUMN CONTENTS, DESCRIPTION	SHORT NOTES
NO. ARTY TUBE ATK, ARTYA	ATTACKER'S NUMBER OF ARTILLERY TUBES	-1 IF NOT AVAILABLE.
CLOSE AIR SPT SORT ATK, FLYA	NUMBER OF CLOSE AIR SUPPORT SORTIES BY ATTACKER	-1 IF NOT AVAILABLE.
ARMR LOSS ATK, CTANKA	ATTACKER'S ARMOR LOSSES	-1 IF NOT AVAILABLE.
ARTY LOSS ATK, CARTYA	ATTACKER'S ARTILLERY LOSSES	-1 IF NOT AVAILABLE.
ACFT LOSS ATK, CFLYA	ATTACKER'S CLOSE AIR SUPPORT AIRCRAFT LOSSES	-1 IF NOT AVAILABLE.
HORSE CAV DEF, CAVD	DEFENDER'S HORSE CAVALRY STRENGTH	-1 IF NOT AVAILABLE.
TOT TANK DEF, TANKD	DEFENDER'S TOTAL NUMBER OF TANKS	-1 IF NOT AVAILABLE.
LITE TANK DEF, LTD	DEFENDER'S NUMBER OF LIGHT TANKS	-1 IF NOT AVAILABLE.
MAIN BTTL TANK DEF, MBTD	DEFENDER'S NUMBER OF MAIN BATTLE TANKS	-1 IF NOT AVAILABLE.
NO. ARTY TUBE DEF, ARTYD	DEFENDER'S NUMBER OF ARTILLERY TUBES	-1 IF NOT AVAILABLE.
CLOSE AIR SPT SORT DEF, FLYD	NUMBER OF CLOSE AIR SUPPORT SORTIES BY DEFENDER	-1 IF NOT AVAILABLE.
ARMR LOSS DEF, CTANKD	DEFENDER'S ARMOR LOSSES	-1 IF NOT AVAILABLE.
ARTY LOSS DEF, CARTYD	DEFENDER'S ARTILLERY LOSSES	-1 IF NOT AVAILABLE.
ACFT LOSS DEF, CFLYD	DEFENDER'S CLOSE AIR SUPPORT AIRCRAFT LOSSES	-1 IF NOT AVAILABLE.
CEA	ATTACKER'S RELATIVE COMBAT EFFECTIVENESS	ON SCALE OF -4 TO +4, 0R -9,
LEADA	ATTACKER'S RELATIVE LEADERSHIP ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
TRNGA	ATTACKER'S RELATIVE TRAINING ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
MORALA	ATTACKER'S RELATIVE MORALE ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
LOGSA	ATTACKER'S RELATIVE LOGISTICS ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
MOMNTA	ATTACKER'S RELATIVE MOMENTUM ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
INTELA	ATTACKER'S RELATIVE INTELLIGENCE ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
TECHA	ATTACKER'S RELATIVE TECHNOLOGY ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
INITA	ATTACKER'S RELATIVE INITIATIVE ADVANTAGE	ON SCALE OF -4 TO +4, 0R -9,
WINA	ATTACKER'S WIN/DRAW/LOSE	+1 = ATK WIN, -1 = ATK LOSS,
KM DIST ADV'D ATK, KMDA	DISTANCE ATTACKER ADVANCED/RETREATED	IN KILOMETERS,
ACHA	ATTACKER'S MISSION ACCOMPLISHMENT SCORE	ON SCALE OF 1 TO 10,
ACHD	DEFENDER'S MISSION ACCOMPLISHMENT SCORE	ON SCALE OF 1 TO 10,
CRIT	CRITERION FOR ASSIGNING WINA	1 IF CLEAR-CUT, 2 IF NOT,

Variable Definition

COLUMN HEADING, ABBREVIATION	COLUMN CONTENTS, DESCRIPTION	SHORT NOTES
QUALA	DEGREE OF INFLUENCE OF FORCE QUALITY	ON SCALE OF -4 TO +4, 0R -9,
RESA	DEGREE OF INFLUENCE OF RESERVES	ON SCALE OF -4 TO +4, 0R -9,
MOBILA	DEGREEE OF INFLUENCE OF MOBILITY	ON SCALE OF -4 TO +4, 0R -9,
AIRA	DEGREE OF INFLUENCE OF AIR SUPERIORITY	ON SCALE OF -4 TO +4, 0R -9,
FPREPA	DEGREE OF INFLUENCE OF FORCE PREPONDERANCE	ON SCALE OF -4 TO +4, 0R -9,
WXA	DEGREE OF INFLUENCE OF WEATHER	ON SCALE OF -4 TO +4, 0R -9,
TERRA	DEGREE OF INFLUENCE OF TERRAIN	ON SCALE OF -4 TO +4, 0R -9,
LEADAA	DEGREE OF INFLUENCE OF LEADERSHIP	ON SCALE OF -4 TO +4, 0R -9,
PLANA	DEGREE OF INFLUENCE OF PLANNING	ON SCALE OF -4 TO +4, 0R -9,
SURPAA	DEGREE OF INFLUENCE OF SURPRISE	ON SCALE OF -4 TO +4, 0R -9,
MANA	DEGREE OF INFLUENCE OF MANEUVERABILITY	ON SCALE OF -4 TO +4, 0R -9,
LOGSAA	DEGREE OF INFLUENCE OF LOGISTICS	ON SCALE OF -4 TO +4, 0R -9,
FORTSA	DEGREE OF INFLUENCE OF FORTIFICATIONS	ON SCALE OF -4 TO +4, 0R -9,
DEEPA	DEGREE OF INFLUENCE OF DEPTH OF POSITION	ON SCALE OF -4 TO +4, 0R -9,
PRIA1	ATTACKER'S PRIMARY TACTICAL SCHEME, PART 1	SEE NOTE 9.
PRIA2	ATTACKER'S PRIMARY TACTICAL SCHEME, PART 2	SEE NOTE 9.
PRIA3	ATTACKER'S PRIMARY TACTICAL SCHEME, PART 3	SEE NOTE 9.
SECA1	ATTACKER'S SECONDARY TACTICAL SCHEME, PART 1	SEE NOTE 9.
SECA2	ATTACKER'S SECONDARY TACTICAL SCHEME, PART 2	SEE NOTE 9.
SECA3	ATTACKER'S SECONDARY TACTICAL SCHEME, PART 3	SEE NOTE 9.
RESOA1	ATTACKER'S PRIMARY RESOLUTION/OUTCOME, PART 1	SEE NOTE 10.
RESOA2	ATTACKER'S PRIMARY RESOLUTION/OUTCOME, PART 2	SEE NOTE 10.
RESOA3	ATTACKER'S PRIMARY RESOLUTION/OUTCOME, PART 3	SEE NOTE 10.
PRID1	DEFENDER'S PRIMARY TACTICAL SCHEME, PART 1	SEE NOTE 9.
PRID2	DEFENDER'S PRIMARY TACTICAL SCHEME, PART 2	SEE NOTE 9.
PRID3	DEFENDER'S PRIMARY TACTICAL SCHEME, PART 3	SEE NOTE 9.
SECD1	DEFENDER'S SECONDARY TACTICAL SCHEME, PART 1	SEE NOTE 9.
SECD2	DEFENDER'S SECONDARY TACTICAL SCHEME, PART 2	SEE NOTE 9.

Variable Definition

COLUMN HEADING, ABBREVIATION	COLUMN CONTENTS, DESCRIPTION	SHORT NOTES
SECD3	DEFENDER'S SECONDARY TACTICAL SCHEME, PART 3	SEE NOTE 9.
RESOD1	DEFENDER'S PRIMARY RESOLUTION/OUTCOME, PART 1	SEE NOTE 10.
RESOD2	DEFENDER'S PRIMARY RESOLUTION/OUTCOME, PART 2	SEE NOTE 10.
RESOD3	DEFENDER'S PRIMARY RESOLUTION/OUTCOME, PART 3	SEE NOTE 10.
STRAPL	ATTACKER STRENGTH ERROR, PLUS	PERCENT OF TABULATED VALUE,
STRAMI	ATTACKER STRENGTH ERROR, MINUS	IN PERCENT,
CASAPL	ATTACKER CASUALTY ERROR, PLUS	IN PERCENT,
CASAMI	ATTACKER CASUALTY ERROR, MINUS	IN PERCENT,
STRDPL	DEFENDER STRENGTH ERROR, PLUS	IN PERCENT,
STRDMI	DEFENDER STRENGTH ERROR, MINUS	IN PERCENT,
CASDPL	DEFENDER CASUALTY ERROR, PLUS	IN PERCENT,
CASDMI	DEFENDER CASUALTY ERROR, MINUS	IN PERCENT,
NOATP	NUMBER OF ACTIVE TIME PERIODS FOR THIS DATABASE	RANGES FROM 1 TO 10.
ATPBYR1	TIME FIRST ACTIVE TIME PERIOD BEGAN	YEAR,
ATPBMN1	"	MONTH-NUMBER,
ATPBDA1	"	DAY OF MONTH,
ATPBHR1	"	24-HOUR MILITARY CLOCK,
ATPEYR1	TIME FIRST ACTIVE TIME PERIOD ENDED	YEAR,
ATPEMN1	"	MONTH-NUMBER,
ATPEDA1	"	DAY OF MONTH,
ATPEHR1	"	24-HOUR MILITARY CLOCK,
...	...	...
...	...	...
...	...	...
ATPBYR(NOATP)	TIME LAST ACTIVE TIME PERIOD BEGAN	YEAR,
ATPBMN(NOATP)	"	MONTH-NUMBER,
ATPBDA(NOATP)	"	DAY OF MONTH,
ATPBHR(NOATP)	"	24-HOUR MILITARY CLOCK,

Variable Definition

COLUMN HEADING, ABBREVIATION	COLUMN CONTENTS, DESCRIPTION	SHORT NOTES
ATPEYR(NOATP)	TIME LAST ACTIVE TIME PERIOD ENDED	YEAR,
ATPEMN(NOATP)	"	MONTH-NUMBER,
ATPEDA(NOATP)	"	DAY OF MONTH,
ATPEHR(NOATP)	"	24-HOUR MILITARY CLOCK,

NOTE 1: NOTE 1: CODES FOR POSTYPE--
0 = At most one defensive posture is given (so, e.g., POST2 = "OO").
1 = A combination posture involving two distinct/separate postures.
2 = An average or intermixture of two or more postures.
9 = More than one posture, but whether separate or intermixed is not available.

NOTE 2: NOTE 2: CODES FOR POST, 1 AND 2--
HD = Hasty defense.
PD = Prepared defense.
FD = Fortified defense.
DL = Delaying action adopted.
WD = Withdrawal adopted.
OO = Not available or not applicable.

NOTE 3: NOTE 3: CODES FOR TERRA, 1 AND 2--
First character: G = Rugged, R = Rolling, F = Flat,
0 = Other or not available.
Second character: W = Heavily Wooded, M = Mixed, B = Bare,
D = Desert, 0 = Other or not available.
Third character: U = Urban, M = Marsh or swamp, D = Dunes,
0 = Other or not available.

NOTE 4: NOTE 4: CODES FOR WEATHER DESCRIPTORS WX1, WX2, AND WX3--
First character: W = Wet, D = Dry, 0 = Other or not available.
Second character: H = Heavy Precipitatiion, L = Light Precipitation,
O = Overcast (no precipitation),
S = Sunny (no precipitation),
0 = Other or not available.
Third character (for local weather): H = Hot, T = Temperate,
C = Cold, 0 = Other or not available.
Fourth character (for general climate):
E = Tropical (i.e., "Equatorial"), D = Desert,
T = Temperate, 0 = Other or not available.

NOTE 5: NOTE 5: CODES FOR SURPA--
+3 = Complete surprise achieved by attacker.
+2 = Substantial surprise achieved by attacker.
+1 = Minor surprise achieved by attacker.
0 = Neither side achieved surprise, or it did not affect the outcome.
-1 = Minor surprise achieved by defender.
-2 = Substantial surprise achieved by defender.
-3 = Complete surprise achieved by defender.
9 = Unknown or not available.

NOTE 6: NOTE 6: CODES FOR AEROA--
+1 = Attacker had air superiority in the theater.
0 = Neither side had theater air superiority.
-1 = Defender had air superiority in the theater.
9 = Unknown or not available.

NOTE 7: NOTE 7: CODES FOR CODE A AND CODE D--
1 = Total strength is also initial strength.
2 = Total strength is an average daily strength.
3 = Total strength is the total strength engaged.

NOTE 8: NOTE 8: CODES FOR CEA, ETC.--
+4 = Very strongly favors the attacker.
+3 = Strongly favors the attacker
+2 = Favors the attacker.
+1 = Somwhat favors the attacker.
0 = Favors neither side.
-1 = Somewhat favors the defender.
-2 = Favors the defender.
-3 = Strongly favors the defender.
-4 = Very strongly favors the defender.
-9 = Unknown or not available.

NOTE 9: NOTE 9: CODES FOR PRIA1, ETC.--
FF = Frontal attack.
EE = Single envelopment.
DE = Double envelopment.
FE = Feint, demonstration, or holding attack.
DD = Defensive plan.
DO = Defensive/offensive plan.
LF = Left flank.
RF = Right flank.
LR = Left rear.
RR = Right rear.
PP = Penetration.
RC = River crossing.
00 = Not applicable, or not available.

NOTE 10: NOTE 10: CODES FOR RESOA1, ETC.–
AA = Annihilated.
PS = Pursued.
WL = Withdrew with heavy losses.
WD = Withdrew.
BB = Breakthrough.
PP = Penetration.
RR = Repulse.
SS = Stalemate.
00 = None of the above, or not available.

NOTE 11: NOTE 11: CODES FOR STRAPL, ETC.–
These are the adjudged greatest possible deviations (plus or minus) from the values given elsewhere in this database.
Zero values generally indicate that the possible deviation is not known.

NOTE 12: NOTE 12: CODES FOR UNKNOWN HOURS--
If no information is available, unknown hours are coded as 9999.
If the battle duration is known, but not its starting and ending times, start time is coded as 5000, and ending time as (5000 + Duration).
Blanks mean "Not Used."

APPENDIX B

DATA BASE

This Appendix provides the readers with the actual data used by the researcher in performance of these experiments. The original source data was from the US Army Concepts Analysis Agency database.

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
001	0.90	0.90	0	HD		0	0	0	0	0	11500	1	11500	0	4000	7500	11300	1	11300
002	1.50	1.50	1	HD	PD	1	0	0	0	0	40000	1	40000	0	400	39600	21000	1	21000
003	3.70	2.80	0	HD		0	0	0	0	0	20000	1	20000	0	5000	15000	20000	1	20000
004			0	PD		0	0	0	-1	0	8500	1	8500	0	3000	5500	16000	1	16000
005			0	HD		0	0	0	0	0	17000	1	17000	0	2000	15000	20000	1	20000
006	3.20	3.60	0	HD		0	0	0	0	0	32000	1	32000	0	13600	18400	37850	1	37850
007	8.00	21.00	0	PD		0	0	0	0	0	33000	1	33000	0	1000	32000	27000	1	27000
008	2.30	2.70	0	PD		0	0	0	0	0	46000	1	46000	0	4000	42000	60000	1	60000
009	4.40	4.80	0	HD		0	0	0	0	0	18996	1	18996	0	4000	14996	21770	3	16770
010	2.80	5.60	0	PD		0	0	0	0	0	25000	1	25000	0	12000	13000	35000	1	35000
011	4.40	3.00	0	PD		0	0	0	1	0	22000	1	22000	0	7000	15000	30000	1	30000
012	3.50	3.50	0	HD		0	0	0	0	0	25000	1	25000	0	5000	20000	30000	1	30000
013	2.40	1.80	0	HD		0	0	0	0	0	23000	1	23000	0	4000	19000	26000	1	26000
014	3.00	2.00	0	HD		0	0	0	2	0	22000	1	22000	0	1000	21000	18000	1	18000
015	6.40	6.40	0	PD		0	0	0	0	0	19000	1	19000	0	8000	11000	16000	1	16000
016	3.10	3.10	0	HD		0	0	0	3	0	15000	1	15000	0	8500	6500	15000	1	15000
017	7.00	7.00	0	HD		0	0	0	3	0	10000	1	10000	0	700	9300	11000	1	11000
018	3.20	3.20	0	PD		0	0	0	0	0	18000	1	18000	0	7500	10500	16000	1	16000
019	2.00	3.50	0	HD		0	0	0	2	0	14000	1	14000	0	4000	10000	18000	1	18000
020	3.20	3.20	0	HD		0	0	0	0	0	14300	1	14300	0	2500	11800	14870	1	14870
021	2.80	2.80	0	HD		0	0	0	0	0	27000	1	27000	0	1500	25500	17500	1	17500
022	1.10	1.10	0	HD		0	0	0	0	0	6800	1	6800	0	3000	3800	3000	1	3000
023	0.70	0.70	0	HD		0	0	0	0	0	4900	1	4900	0	6	4894	6800	1	6800
024	2.80	2.00	1	HD	PD	1	0	0	0	0	22000	1	22000	0	500	21500	10000	1	10000
025	1.60	1.60	0	HD		0	0	0	0	0	9000	1	9000	0	6000	3000	13000	1	13000
026	1.00	0.60	0	HD		0	0	0	2	0	9000	1	9000	0	300	8700	21000	1	21000
027	1.80	2.70	0	HD		0	0	0	2	0	11000	1	11000	0	30	10970	22000	1	22000
028	5.60	5.60	1	HD	PD	1	0	0	0	0	28000	1	28000	0	1000	27000	16000	1	16000
029	1.50	1.50	1	HD	PD	1	1	0	0	0	12000	1	12000	0	4000	8000	6000	1	6000
030	4.00	4.40	0	HD		0	0	0	1	0	15000	1	15000	0	2000	13000	12000	1	12000
031	3.80	4.10	0	HD		0	0	0	0	0	60000	1	60000	0	8000	52000	30000	1	30000
032	8.80	8.00	1	HD	PD	1	1	0	2	0	76000	1	76000	0	2000	74000	107000	1	107000
033			0	PD		0	0	0	3	0	50000	1	50000	0	1000	49000	80000	1	80000
034	5.00	5.00	0	HD		0	0	0	0	0	9500	1	9500	0	1500	8000	7500	1	7500
035	1.80	1.80	0	HD		0	0	0	2	0	50000	1	50000	0	10000	40000	70000	1	70000
036	5.60	7.00	1	HD	PD	1	0	0	0	0	22000	1	22000	0	3500	18500	31700	1	31700
037			0	HD		0	0	0	1	0	33000	1	33000	0	1100	31900	30000	1	30000
038	3.40	2.00	0	HD		0	0	0	0	0	6000	1	6000	0	500	5500	6400	1	6400
039	0.80	1.20	0	HD		0	0	0	1	0	4000	1	4000	0	1500	2500	3000	1	3000
040	1.00	1.00	0	HD		0	0	0	0	0	2800	1	2800	0	600	2200	3400	1	3400
041	1.00	1.00	0	HD		0	0	0	0	0	24000	1	24000	0	2000	22000	35000	1	35000
042			0	HD		0	0	0	0	0	50000	1	50000	0	6000	44000	38000	1	38000
043	8.00	5.00	0	HD		0	0	0	0	0	35000	1	35000	0	2000	33000	23000	1	23000
044	6.40	4.80	1	HD	PD	1	1	0	0	0	18000	1	18000	0	2700	15300	25000	1	25000
045	2.40	5.20	1	HD	PD	1	0	0	0	0	63000	1	63000	0	8000	55000	57000	1	57000
046	5.70	8.60	1	HD	PD	1	0	0	0	0	80000	1	80000	0	9000	71000	50000	1	50000
047			0	HD		0	0	0	0	0	40000	1	40000	0	3000	37000	36000	1	36000

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
001	0	1000	10300	1500	0	0	0	8	0	0	8	0	1400	0	0	0	6	0	0	0	0
002	0	5000	16000	7500	0	0	0	12	0	0	0	0	11000	0	0	0	10	0	0	10	0
003	0	5800	14200	4000	0	0	0	8	0	0	0	0	4000	0	0	0	40	0	0	20	0
004	0	1000	15000	2500	0	0	0	9	0	0	9	0	10000	0	0	0		0	0	0	0
005	0	7000	13000	7000	0	0	0	12	0	0	0	0	10000	0	0	0	22	0	0	22	0
006	0	6100	31750	11000	0	0	0	26	0	0	26	0	12850	0	0	0	100	0	0	0	0
007	0	3000	24000		0	0	0	70	0	0	0	0		0	0	0		0	0		0
008	0	2000	58000	16000	0	0	0		0	0		0	13000	0	0	0		0	0		0
009	5000	5000	16770	6210	0	0	0	60	0	0		0	9200	0	0	0	25	0	0		0
010	0	2000	33000	10000	0	0	0	80	0	0	80	0	15000	0	0	0	50	0	0	0	0
011	0	18000	12000	12000	0	0	0		0	0		0	14000	0	0	0	42	0	0	42	0
012	0	15000	15000	10000	0	0	0	70	0	0	0	0	8000	0	0	0	46	0	0	46	0
013	0	14000	12000	7000	0	0	0	12	0	0	0	0	7000	0	0	0	18	0	0	18	0
014	0	7000	11000	5000	0	0	0		0	0		0	8000	0	0	0	10	0	0	10	0
015	0	4000	12000	8000	0	0	0	37	0	0	0	0	8000	0	0	0	28	0	0	28	0
016	0	2000	13000	10000	0	0	0	26	0	0	26	0	9000	0	0	0	80	0	0	0	0
017	0	3500	7500	5000	0	0	0		0	0		0	5000	0	0	0	15	0	0	6	0
018	0	6000	10000	5000	0	0	0		0	0	4	0	5000	0	0	0	28	0	0	15	0
019	0	10000	8000	5000	0	0	0		0	0	0	0	8000	0	0	0	38	0	0	38	0
020	0	2500	12370	3500	0	0	0	20	0	0	0	0	2500	0	0	0	15	0	0	7	0
021	0	6000	11500	9000	0	0	0	25	0	0	0	0	6500	0	0	0	16	0	0	16	0
022	0	1	2999	800	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0
023	0	6000	800	500	0	0	0	0	0	0	0	0	800	0	0	0	0	0	0	0	0
024	0	500	9500	9500	0	0	0		0	0		0	2000	0	0	0		0	0		0
025	0	1000	12000	5000	0	0	0	12	0	0	12	0	6000	0	0	0	13	0	0	0	0
026	0	5000	16000	3000	0	0	0		0	0	0	0	3600	0	0	0		0	0		0
027	0	13000	9000	3500	0	0	0		0	0	0	0	6000	0	0	0	30	0	0	30	0
028	0	9000	7000	9000	0	0	0		0	0	0	0	4000	0	0	0		0	0		0
029	0	2000	4000		0	0	0		0	0		0		0	0	0	6	0	0	6	0
030	0	7000	5000	6000	0	0	0		0	0	0	0	7000	0	0	0	0	0	0	0	0
031	0	2000	28000	20000	0	0	0	20	0	0	20	0	10000	0	0	0	25	0	0	0	0
032	0	10000	97000	34000	0	0	0	186	0	0	0	0	47000	0	0	0	500	0	0	370	0
033	0	30000	50000		0	0	0		0	0		0		0	0	0		0	0		0
034	0	2500	5000	6000	0	0	0	6	0	0	0	0	6000	0	0	0	0	0	0	0	0
035	0	14000	56000	15000	0	0	0		0	0		0	15000	0	0	0		0	0	4	0
036	0	2500	29200	10000	0	0	0	30	0	0	0	0	14500	0	0	0	58	0	0	10	0
037	0	3400	26600		0	0	0		0	0		0		0	0	0		0	0		0
038	0	2500	3900	6000	0	0	0	13	0	0	0	0	6400	0	0	0	38	0	0	6	0
039	0	300	2700	800	0	0	0	4	0	0	4	0	510	0	0	0	16	0	0		0
040	0	1900	1500		0	0	0	0	0	0	0	0	100	0	0	0		0	0		0
041	0	130	34870		0	0	0	20	0	0	6	0		0	0	0		0	0		0
042	0	19000	19000		0	0	0		0	0		0		0	0	0		0	0	49	0
043	0	1500	21500	8000	0	0	0	50	0	0	0	0	5000	0	0	0	8	0	0	6	0
044	0	4400	20600		0	0	0		0	0		0		0	0	0	6	0	0	6	0
045	0	7000	50000	15000	0	0	0	70	0	0	10	0	12000	0	0	0	60	0	0	8	0
046	0	14000	36000	29000	0	0	0	71	0	0		0	20000	0	0	0	84	0	0	84	0
047	0	11000	25000	10000	0	0	0	30	0	0		0	11000	0	0	0	31	0	0	31	0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
001	-1	0	1	0	1	-6.4	1	-1	-1	0	0	0	0	0	0	0	0	0	FF	
002	0	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	-1	0	FF	
003	0	0	-1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	FF	
004	0	0	0	0	-1	-2	1	0	-1	0	0	-1	-1	-1	0	0	-1	0	FF	
005	0	0	1	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	FF	
006	0	0	0	0	0	-2	1	0	0	0	0	0	0	0	0	0	0	0	FF	EE
007	0	0	0	0	1	3.2	1	0	0	0	0	0	1	0	0	0	-1	0	FF	
008	0	0	0	0	0	0	1	0	-2	0	0	0	0	0	0	0	-1	0	FF	
009	0	0	0	0	1	1.5	1	0	0	0	0	0	0	0	0	0	0	0	FF	
010	0	0	0	0	0	-2.5	1	0	0	0	0	0	-1	0	0	0	-1	0	EE	RF
011	1	0	0	0	1	1	1	1	0	0	0	0	1	1	0	0	-1	0	EE	RF
012	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	EE	LF
013	0	0	1	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	EE	LF
014	0	0	0	0	1	2	1	0	0	0	0	0	1	2	0	0	0	0	FF	
015	0	0	0	0	1	9	1	0	0	0	0	0	0	0	0	0	-1	-1	FF	
016	0	0	0	0	1	-2	1	0	0	0	0	0	1	1	0	0	0	0	FF	
017	0	0	0	0	1	3	1	0	0	0	0	0	1	2	0	0	0	0	FF	
018	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	-1	0	FF	
019	0	0	0	0	1	3	1	0	0	0	0	0	1	2	0	0	0	0	DE	
020	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	FF	
021	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	FF	
022	-1	0	0	0	0	-0.5	1	-1	0	0	0	0	0	0	0	0	0	0	FF	
023	0	0	0	0	1	0.8	1	1	0	0	0	0	0	0	0	0	0	0	FF	
024	0	0	0	0	1	0	2	0	0	0	0	0	-1	0	0	0	-1	0	FF	
025	0	0	0	0	1	-0.3	1	0	0	0	0	-1	0	0	0	0	0	0	FF	
026	1	0	0	0	1		1	1	0	0	0	-1	1	2	0	0	0	0	FF	DE
027	0	0	0	0	1	0.8	1	1	0	0	0	0	1	2	0	0	-1	0	EE	RF
028	1	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	-1	0	FF	
029	0	0	0	0	1	1	1	0	2	0	0	1	0	0	0	0	-1	0	FF	
030	1	0	0	0	1	2.1	1	1	1	1	0	0	1	1	0	0	0	0	EE	RF
031	-1	0	0	0	0	0	1	-1	0	0	0	1	0	0	0	0	0	0	FF	
032	1	0	0	0	1	4	1	1	0	0	0	0	1	1	0	0	-1	0	EE	RF
033	1	0	0	0	1		1	1	0	0	0	0	0	1	0	0	-1	0	FF	
034	0	0	0	0	1		1	0	0	0	0	0	1	0	-1	0	0	0	FF	
035	0	0	0	0	1	0	2	0	0	0	0	0	1	1	0	0	0	0	FF	
036	0	0	0	0	0	2.4	2	0	0	0	0	0	1	0	0	0	-1	0	FF	
037	0	0	0	0	1		1	0	0	0	0	0	1	1	0	0	0	0	EE	RF
038	0	0	0	0	1	6.4	1	0	0	0	0	0	1	0	0	0	0	0	FF	
039	-1	0	0	0	1	-1	1	-1	-1	0	0	0	0	1	0	0	0	0	FF	
040	0	0	0	0	2	0.8	1	0	0	0	0	0	1	0	1	0	0	0	FF	
041	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-1	FF	
042	0	0	0	0	1		1	0	0	0	0	0	1	0	0	0	0	0	DE	
043	0	0	0	0	1	2	1	0	0	0	0	0	1	0	0	0	0	0	FF	EE
044	0	0	0	0	1	1.2	1	0	0	0	0	0	0	0	0	0	0	0	FF	
045	0	0	0	0	1	0	1	0	-1	0	0	0	1	0	-1	0	-1	-1	FF	
046	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	-1	0	FF	
047	0	0	0	0	1	2.4	1	0	0	0	0	0	1	0	0	0	0	0	FF	EE

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
001					DO	FF					1	1600	07	02	1430	1600	07	02	1930
002					DO	FF					1	1620	11	08	1200	1620	11	08	1300
003					DD						2	1622	05	06	0330	1622	05	06	1000
004					DO	DE					1	1626	04	25		1626	04	25	
005					DO						1	1626	08	27		1626	08	27	
006	LF				DO	EE	LR				1	1631	09	17	1430	1631	09	17	1830
007					DO	FF					1	1632	04	15		1632	04	16	
008					DO	FF					2	1632	09	03	1000	1632	09	03	2000
009					DO	FF		EE	RR		1	1632	11	16	1100	1632	11	16	2000
010		FE	LF		DO						1	1634	09	06	0530	1634	09	06	1230
011		FF			DO	FF					1	1636	10	04		1636	10	04	
012		FF			DO	EE	RF				1	1642	11	02	0700	1642	11	02	1000
013		FF			DO	FF					1	1643	05	19	0330	1643	05	19	1000
014		EE			DD						1	1643	11	24		1643	11	24	
015		EE	LF		DD						4	1644	08	03	1700	1644	08	03	2300
016		EE	RR		DD						1	1645	03	06		1645	03	06	
017					DD						1	1645	05	02		1645	05	02	
018		EE	RF		DO	EE	RF	EE	RF		1	1645	08	03	1700	1645	08	03	2000
019					DO	EE	RF				2	1648	08	10	0500	1648	08	10	0530
020					DO	FF					1	1642	10	23	1500	1642	10	23	1800
021					DO	FF					1	1644	07	02	1900	1644	07	02	2200
022					DO	FF					1	1644	09	01		1644	09	01	
023					DD						1	1644	08	15		1644	08	15	
024		EE	LF		DD						2	1644	10	27	0600	1644	10	27	0800
025					DO	FF					1	1645	06	14	1000	1645	06	14	1300
026					DD						1	1648	08	17		1648	08	18	
027		FF			DD						1	1650	09	03	0400	1650	09	03	0600
028					DO	FF					1	1651	09	03	1430	1651	09	03	1800
029					DD						1	1652	07	05	0800	1652	07	05	1400
030		FF			DO	FF					1	1658	06	14	0800	1658	06	14	1200
031					DO	DE					1	1664	08	01	0600	1664	08	01	1400
032		FF			DD						1	1683	09	12	0530	1683	09	12	1800
033		EE	LR		DD						1	1673	11	11		1673	11	11	
034		DE			DO	FF					1	1674	06	16	5000	1674	06	16	5300
035					DD						1	1674	08	11	1000	1674	08	11	2400
036					DO	FF	EE				1	1674	10	04	5000	1674	10	04	5700
037		FF			DD						1	1675	01	05		1675	01	05	
038		EE	RF		DO	FF					1	1675	06	28	0800	1675	06	28	1000
039					DO	DE					1	1685	07	06	0300	1685	07	06	0500
040					DD						1	1689	07	27	1945	1689	07	27	2100
041					DO	DE					1	1689	08	25	0900	1689	08	25	1830
042					DD						1	1690	07	01		1690	07	01	
043	LR				DO	FF					1	1690	07	11	1100	1690	07	11	1400
044					DD						1	1691	07	22	1400	1691	07	22	2000
045					DD						1	1692	08	03	1200	1692	08	03	1900
046					DD						1	1693	07	29	0400	1693	07	29	1500
047	LF				DD						1	1693	10	04	5000	1693	10	04	5430

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
001	R	B	D				D	S	T	T									-1
002	R	M	0				D	S	T	T									0
003	R	M	0				D	S	H	T									1
004	R	M	0				D	S	T	T									-1
005	R	M	0				D	S	T	T									1
006	R	M	0				D	S	T	T									-1
007	R	M	0				D	S	T	T									1
008	G	M	0				W	L	T	T									0
009	R	M	0				D	S	T	T									1
010	R	M	0				D	S	T	T									1
011	R	M	0				D	S	T	T									1
012	R	M	0				D	S	T	T									1
013	R	M	0				D	S	T	T									2
014	R	M	0				D	S	T	T									2
015	G	M	0				D	S	T	T									0
016	G	M	0				D	S	T	T									-1
017	R	M	0				D	S	T	T									1
018	R	M	0				D	S	T	T									0
019	R	M	0				D	S	T	T									1
020	R	M	0				D	S	T	T									0
021	R	M	0				W	H	T	T									1
022	R	M	0				D	S	T	T									-1
023	R	M	0				D	S	T	T									1
024	R	M	0				D	S	T	T									0
025	R	M	0				D	S	T	T									-1
026	R	M	0				W	H	T	T									2
027	R	M	0				W	L	T	T									1
028	R	M	0				D	S	T	T									1
029			U				D	S	H	T									0
030	R	B	D				D	S	T	T									2
031	R	M	0	F	M		D	S	T	T									-1
032	R	M	0				D	S	T	T									1
033	R	M	0				W	L	C	T									1
034	R	M	0				D	S	T	T									2
035	R	M	0				D	S	T	T									1
036	R	M	0				W	H	T	T									1
037	R	M	0				D	S	T	T									1
038	R	M	0				D	S	T	T									1
039	F	M	0				W	L	T	T									-1
040	G	M	0				D	S	T	T									1
041	R	M	0				D	S	T	T									-1
042	R	M	0				D	S	T	T									1
043	R	M	0				D	S	T	T									1
044	R	M	0				D	S	T	T	W	H	T	T					0
045	G	M	0				W	L	T	T									-1
046	R	M	0				D	S	T	T									1
047	R	M	0				D	S	T	T									1

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
001	0	0	0	0	0	-1	-1
002	0	0	0	0	-1	1	1
003	0	0	0	0	0	1	1
004	0	0	-1	0	0	-1	-1
005	0	1	0	0	0	1	1
006	0	0	0	0	0	-1	-1
007	0	0	0	0	-1	1	1
008	0	0	0	0	-2	0	-1
009	0	0	0	-1	-1	1	1
010	0	0	0	0	-1	-1	-1
011	0	0	0	0	-2	1	1
012	0	0	0	0	-1	1	1
013	0	0	1	0	0	-2	1
014	0	0	1	0	0	2	1
015	0	0	1	0	-1	1	1
016	0	0	0	0	-1	0	-1
017	0	0	1	0	0	1	1
018	0	0	0	0	0	0	1
019	0	0	1	0	0	1	1
020	0	0	0	0	0	0	1
021	0	0	0	0	0	1	1
022	0	0	0	0	0	-2	-1
023	0	0	0	0	1	1	1
024	0	0	0	0	0	0	-1
025	0	0	0	0	0	-1	-1
026	1	0	1	0	0	1	1
027	1	0	0	1	-1	1	1
028	1	0	0	0	-1	1	1
029	0	0	0	0	0	0	1
030	0	0	0	0	-1	2	1
031	-1	0	0	0	-1	-1	-1
032	1	0	0	0	0	1	1
033	0	0	0	1	0	1	1
034	0	0	0	0	-1	2	1
035	0	0	0	0	0	1	1
036	0	0	0	0	-1	1	0
037	0	0	1	0	-1	1	1
038	0	0	0	0	0	1	1
039	-1	0	0	1	-1	-1	-1
040	-1	0	0	0	0	1	1
041	0	0	0	0	-1	-1	-1
042	0	0	0	0	0	1	1
043	0	0	0	0	-1	1	1
044	0	0	0	0	-1	0	1
045	0	0	0	0	-1	-1	-1
046	0	0	0	0	-1	1	1
047	0	0	0	0	0	1	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
048	4.20	2.70	0	PD		0	0	0	1	0	50000	1	50000	0	500	49500	100000	1	100000
049	1.20	3.20	0	PD		0	0	0	0	0	21500	1	21500	0	9600	11900	80000	1	80000
050	6.40	7.10	0	HD		0	0	0	0	0	52000	1	52000	0	12883	39117	56000	1	56000
051	4.80	5.20	1	HD	PD	1	0	0	0	0	62000	1	62000	0	3620	58380	60000	1	60000
052	6.40	6.00	0	HD		0	0	0	0	0	80000	1	80000	0	4000	76000	85000	1	85000
053	8.20	8.80	0	PD		0	0	0	0	0	110000	1	110000	0	24000	86000	80000	1	80000
054			0	HD		0	0	0	0	0	63000	1	63000	0	4500	58500	60000	1	60000
055	2.70	4.30	0	HD		0	0	0	0	0	18100	1	18100	0	4551	13549	22000	1	22000
056	3.40	3.70	0	HD		0	0	0	1	0	29000	1	29000	0	6332	22668	24500	1	24500
057	2.30	2.20	0	HD		0	0	0	0	0	35000	1	35000	0	2500	32500	26000	1	26000
058	2.80	4.00	1	HD	PD	1	0	0	0	0	50000	1	50000	0	12000	38000	60000	1	60000
059	4.80	5.50	0	HD		0	0	0	1	0	50000	1	50000	0	4737	45263	66000	1	66000
060	3.50	3.20	0	HD		0	0	0	0	0	22562	1	22562	0	3876	18686	41000	1	41000
061	4.40	3.00	0	HD		0	0	0	2	0	31000	1	31000	0	5000	26000	31200	1	31200
062	0.60	0.80	0	HD		0	0	0	2	0	2400	1	2400	0	110	2290	2200	1	2200
063	0.70	1.50	0	HD		0	0	0	0	0	5400	1	5400	0	1558	3842	9000	1	9000
064	3.20	5.60	0	HD		0	0	0	0	0	29000	1	29000	0	2906	26094	34500	1	34500
065	4.80	5.20	0	HD		0	0	0	0	0	65000	1	65000	0	14300	50700	62000	1	62000
066	3.20	0.70	0	HD		0	0	0	0	0	50050	1	50050	0	500	49550	2975	1	2975
067	5.20	6.40	0	HD		0	0	0	0	0	32000	1	32000	0	13768	18232	44000	1	44000
068	5.50	10.00	0	PD		0	0	0	0	0	60000	1	60000	0	2500	57500	36000	1	36000
069	2.70	4.00	0	HD		0	0	0	-2	0	42000	1	42000	0	10150	31850	22000	1	22000
070	4.30	7.60	0	HD		0	0	0	2	0	33000	1	33000	0	11589	21411	65000	1	65000
071	10.50	7.50	0	HD		0	0	0	1	0	32000	1	32000	0	1800	30200	50000	1	50000
072	3.40	4.80	0	HD		0	0	0	0	0	36000	1	36000	0	12797	23203	43300	1	43300
073	5.60	4.20	0	PD		0	0	0	2	0	80000	1	80000	0	7587	72413	31000	1	31000
074	3.20	3.20	1	HD	PD	1	0	0	0	0	24000	1	24000	0	2800	21200	30000	1	30000
075	4.00	4.00	0	HD		0	0	0	0	0	45000	1	45000	0	2762	42238	60000	1	60000
076	5.40	6.40	0	PD		0	0	0	0	0	50900	1	50900	0	19100	31800	59500	1	59500
077	1.00	1.20	0	HD		0	0	0	0	0	4500	1	4500	0	1500	3000	4800	1	4800
078			0	HD		0	0	0	0	0	38000	1	38000	0	1000	37000	13500	1	13500
079	5.00	6.40	0	HD		0	0	0	2	0	19000	1	19000	0	1300	17700	17000	1	17000
080	2.40	4.00	0	HD		0	0	0	0	0	30000	1	30000	0	6000	24000	30000	1	30000
081	8.00	11.40	0	PD		0	0	0	0	0	50000	1	50000	0	16670	33330	53400	1	53400
082	0.50	0.70	1	HD	PD	1	0	0	0	0	2650	1	2650	0	1054	1596	3200	1	3200
083	0.20	0.20	0	FD		0	0	0	0	0	1100	1	1100	0	486	614	1800	1	1800
084	2.40	2.60	0	HD		0	0	0	0	0	13000	1	13000	0	313	12687	13000	1	13000
085	1.30	0.20	0	HD		0	0	0	2	0	2420	1	2420	0	12	2408	1520	1	1520
086	0.60	0.30	0	HD		0	0	0	2	0	4800	3	1250	3550	44	4756	1200	3	800
087	1.50	1.50	0	HD		0	0	0	0	0	4400	3	3300	1100	556	3844	7000	1	7000
088	4.00	2.80	0	HD		0	0	0	1	0	11200	1	11200	0	1090	10110	9000	1	9000
089	0.60	1.20	0	FD		0	0	0	0	0	5000	1	5000	0	600	4400	11000	1	11000
090	1.00	1.60	0	HD		0	0	0	0	0	13000	3	2000	11000	358	12642	11000	3	5000
091	1.60	1.60	0	HD		0	0	0	0	0	2100	1	2100	0	324	1776	3050	1	3050
092	0.20	0.20	0	HD		0	0	0	-3	0	1100	1	1100	0	929	171	1025	1	1025
093	2.00	2.00	0	HD		0	0	0	0	0	1900	1	1900	0	532	1368	4449	1	4449
094	0.60	0.90	0	HD		0	0	0	1	0	900	1	900	0	258	642	1551	1	1551

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
048	0	30000	70000	16000	0	0	0	60	0	0	0	0	40000	0	0	0	200	0	0	145	0
049	0	1300	78700	8500	0	0	0	4	0	0	4	0	8500	0	0	0	100	0	0		0
050	0	34190	21810	20000	0	0	0	60	0	0		0	17000	0	0	0	90	0	0	60	0
051	0	19000	41000	16000	0	0	0	120	0	0		0	17000	0	0	0	70	0	0	54	0
052	0	15000	70000	21000	0	0	0	32	0	0		0	20000	0	0	0	50	0	0	25	0
053	0	12000	68000	25000	0	0	0	100	0	0		0	25000	0	0	0	60	0	0	16	0
054	0	6000	54000	22000	0	0	0		0	0	0	0	20000	0	0	0	159	0	0	159	0
055	0	4850	17150	9000	0	0	0	19	0	0	7	0	4500	0	0	0	50	0	0	0	0
056	0	4819	19681	10000	0	0	0	40	0	0	16	0	7000	0	0	0	82	0	0		0
057	0	4000	22000	8000	0	0	0	98	0	0	1	0	4000	0	0	0	56	0	0	0	0
058	0	6000	54000	10000	0	0	0	101	0	0	32	0	15000	0	0	0	100	0	0	0	0
059	0	13176	52824	19900	0	0	0	192	0	0		0	22000	0	0	0	121	0	0	63	0
060	0	7444	33556	5852	0	0	0	60	0	0		0	12700	0	0	0	98	0	0	19	0
061	0	6630	24570	9000	0	0	0	33	0	0	0	0	7000	0	0	0	42	0	0	40	0
062	0	1800	400	40	0	0	0	2	0	0	0	0	400	0	0	0	12	0	0	12	0
063	0	309	8691	400	0	0	0	12	0	0	12	0		0	0	0	16	0	0	0	0
064	0	2873	31627	10800	0	0	0	97	0	0		0	7500	0	0	0	94	0	0	3	0
065	0	13400	48600	17000	0	0	0	214	0	0	5	0	12600	0	0	0	177	0	0	60	0
066	0	63	2912	15000	0	0	0	53	0	0	53	0	0	0	0	0	12	0	0	0	0
067	0	9000	35000	14000	0	0	0	88	0	0	45	0	14000	0	0	0	145	0	0		0
068	0	1500	34500	10000	0	0	0	68	0	0	11	0	5000	0	0	0	28	0	0	7	0
069	0	548	21452	10000	0	0	0	115	0	0	72	0	5400	0	0	0	79	0	0		0
070	0	22000	43000	11000	0	0	0	167	0	0		0	14000	0	0	0	210	0	0	131	0
071	0	8200	41800		0	0	0		0	0		0		0	0	0		0	0	8	0
072	0	18500	24800	10500	0	0	0	193	0	0	26	0	6382	0	0	0	230	0	0	103	0
073	0	9097	21903	28000	0	0	0	340	0	0	10	0	10000	0	0	0	200	0	0	101	0
074	0	1800	28200		0	0	0	21	0	0	2	0		0	0	0	45	0	0		0
075	0	7086	52914		0	0	0	187	0	0	0	0		0	0	0	170	0	0	43	0
076	0	15500	44000	13000	0	0	0	240	0	0	172	0	10000	0	0	0	248	0	0	0	0
077	0	650	4150	0	0	0	0		0	0		0	0	0	0	0		0	0		0
078	0	1000	12500		0	0	0		0	0	0	0		0	0	0	17	0	0	17	0
079	0	3700	13300	5700	0	0	0		0	0		0	4000	0	0	0		0	0	17	0
080	0	3600	26400	9000	0	0	0	130	0	0	74	0	7500	0	0	0	120	0	0	10	0
081	0	15697	37703	12000	0	0	0		0	0		0	20000	0	0	0	275	0	0	52	0
082	0	479	2721	0	0	0	0		0	0		0	0	0	0	0	6	0	0	5	0
083	0	18	1782		0	0	0	1	0	0	1	0	0	0	0	0	14	0	0	0	0
084	0	150	12850		0	0	0	12	0	0	0	0		0	0	0		0	0		0
085	0	996	524	20	0	0	0	18	0	0	0	0	20	0	0	0	6	0	0	5	0
086	400	215	985		0	0	0	5	0	0	0	0		0	0	0	2	0	0	2	0
087	0	316	6684		0	0	0	10	0	0	0	0	0	0	0	0		0	0	0	0
088	0	551	8449		0	0	0		0	0	0	0		0	0	0		0	0	0	0
089	0	130	10870	0	0	0	0	10	0	0	0	0	0	0	0	0		0	0	0	0
090	6000	382	10638		0	0	0	16	0	0	0	0		0	0	0	14	0	0	0	0
091	0	1050	2000	0	0	0	0	4	0	0	0	0	0	0	0	0	9	0	0	9	0
092	0	72	953	350	0	0	0	2	0	0	2	0	125	0	0	0	0	0	0		0
093	0	420	4029	155	0	0	0	2	0	0	0	0	200	0	0	0	4	0	0	4	0
094	0	420	1131	60	0	0	0	0	0	0		0	200	0	0	0	4	0	0	0	0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
048	1	0	0	0	1	1	1	1	0	0	0	-1	1	1	0	0	-1	0	FF	
049	1	0	0	0	1	-6	1	1	-1	0	0	-1	0	0	0	-1	-1	-1	FF	
050	0	0	0	0	1	2.7	1	0	0	0	0	0	1	0	0	0	0	0	FF	
051	0	0	0	0	1	3	1	0	1	0	0	0	1	0	0	0	-1	0	EE	RF
052	0	0	0	1	1	2.4	1	0	0	0	0	0	1	0	0	0	0	0	FF	
053	0	0	0	0	1	1.4	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
054	1	0	0	0	0		1	1	0	0	0	0	1	0	0	0	1	0	FF	
055	-1	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	FF	
056	-1	0	0	0	1	-2.7	1	-1	1	0	0	0	0	1	0	0	0	0	FF	
057	1	0	0	0	0	1.2	1	1	0	0	0	0	0	0	0	0	0	0	FF	
058	0	0	0	0	1	0	1	0	0	0	0	0	0	0	-1	0	-1	0	FF	
059	2	0	0	0	1	1.8	1	1	0	0	0	0	1	1	0	0	0	0	FF	
060	2	0	0	0	1	1.2	1	1	0	0	0	0	0	0	0	0	0	0	FF	
061	2	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	FF	
062	0	0	0	0	3	1	1	0	0	0	0	0	1	2	0	0	0	0	FF	
063	0	0	0	0	1	0	1	-1	-1	-1	0	-1	0	0	0	0	0	0	FF	
064	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	FF	
065	0	0	0	0	1	1.6	1	0	0	0	0	0	1	0	0	0	0	0	FF	
066	-1	0	0	0	0	-1	1	-2	0	0	0	1	0	0	0	0	0	0	FF	
067	0	0	0	0	0	0	1	0	0	0	0	-1	-1	0	0	0	0	0	FF	
068	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	FF	EE
069	-1	0	0	0	-1	-2	1	-1	0	-1	0	0	0	-1	-1	0	0	0	EE	LF
070	1	0	0	0	1	3.2	1	2	0	1	0	0	1	2	0	0	0	0	EE	LF
071	0	0	0	0	1	5	1	0	0	0	0	0	2	1	0	0	0	0	EE	LR
072	1	0	0	0	0	1	2	1	-1	1	0	0	0	0	0	0	0	0	FF	
073	0	0	0	0	1	1.5	1	0	0	0	0	0	2	2	0	0	-1	0	FF	DE
074	0	0	0	0	0	-1	2	0	-1	0	0	0	-1	0	0	0	0	0	FF	
075	1	0	0	0	0	2	1	1	0	0	0	0	1	0	0	0	0	0	FF	
076	0	0	0	0	0	0	1	0	0	0	0	0	-1	0	-1	0	-1	0	FF	
077	0	0	0	0	-1	-0.8	1	0	0	0	0	0	-1	0	0	0	0	0	FF	
078	0	0	0	0	0		1	0	0	2	0	2	0	0	0	0	0	0	DE	
079	0	0	0	0	1	7	1	0	0	0	0	0	1	2	1	0	0	0	EE	LF
080	0	0	0	0	0	-1	1	0	0	0	0	0	0	0	0	0	0	0	EE	LF
081	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	1	0	EE	RR
082	1	0	0	0	0	2	1	1	1	0	0	0	0	0	0	0	-1	0	FF	
083	0	0	0	0	1	0	1	0	0	0	0	0	0	0	-1	0	-1	0	FF	
084	2	0	1	0	2	0.6	1	1	0	0	0	0	0	0	0	0	0	0	FF	
085	0	0	0	0	2	0.9	1	0	0	0	0	0	1	2	0	0	0	0	FF	
086	0	0	0	0	1	1.5	1	0	0	0	0	0	0	1	0	0	0	0	FF	
087	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	FF	
088	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	-1	FF	
089	0	-1	0	0	1	-3.2	1	0	0	0	0	0	0	0	0	-1	0	0	FF	
090	0	0	0	0	-1	2	2	0	0	0	0	0	0	0	0	0	0	0	FF	
091	2	0	0	0	1	1.5	1	1	0	0	0	0	0	0	0	0	0	0	FF	
092	0	0	0	0	0	-1	1	0	-1	0	0	0	-2	-1	0	0	0	-1	FF	
093	2	0	0	0	0	2.4	2	1	0	0	0	0	-1	0	0	0	0	-1	FF	
094	0	0	0	0	2	3.2	1	0	0	0	0	0	1	1	0	0	0	0	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
048					DD						1	1697	09	11	1500	1697	09	11	1930
049					DO	FF		DE			1	1709	06	28		1709	06	28	
050					DD						1	1704	08	13	1230	1704	08	13	2100
051					DD						1	1706	05	23	1300	1706	05	23	1900
052		DE			DO	FF					1	1708	07	11	1500	1708	07	11	2100
053		EE	LF		DO	FF					1	1709	09	11	0800	1709	09	11	1500
054					DO	FF					1	1716	08	05	0700	1716	08	05	1200
055					DO	FF					1	1741	04	10	1200	1741	04	10	1845
056					DO	FF		EE	RR		1	1742	05	17	0800	1742	05	17	1200
057					DO	FF					1	1743	06	27		1743	06	27	
058		FE			DO	FF					1	1745	05	11	0500	1745	05	11	1300
059					DO	FF					1	1745	06	04	0400	1745	06	04	1100
060		EE	LR		DD						1	1745	09	30	0700	1745	09	30	1100
061		EE	LR		DO	FF					1	1745	12	14	1400	1745	12	14	1700
062					DD						1	1745	09	21	0430	1745	09	21	0440
063					DO	DE					1	1746	04	16	1310	1746	04	16	1350
064					DO	FF					1	1756	10	01	1100	1756	10	01	1500
065		EE	RF		DO	FF					1	1757	05	06	1100	1757	05	06	1500
066					DO	FF					1	1757	06	23	0800	1757	06	23	1700
067		EE	RF		DO	FF					1	1757	06	18	1400	1757	06	18	2100
068	RR				DO	FF					1	1757	07	26	0900	1757	07	26	1600
069					DO	FF	EE				1	1757	11	05	1530	1757	11	05	1700
070		FE			DO	FF					1	1757	12	05	1300	1757	12	05	1600
071					DO	FF		DE			1	1758	06	23	1300	1758	06	23	1800
072					DO	FF					1	1758	08	25	1000	1758	08	25	1930
073					DD						1	1758	10	14	0500	1758	10	14	0800
074					DD						1	1759	04	13		1759	04	13	
075					DD						1	1759	08	01	0600	1759	08	01	1100
076		FE	LR		DD						1	1759	08	12	1130	1759	08	12	1730
077					DO	FF					1	1759	09	13	1000	1759	09	13	1015
078					DD						1	1759	11	20	1100	1759	11	20	1730
079		FE			DD						1	1760	07	31		1760	07	31	
080					DO	FF					1	1760	08	15	0500	1760	08	15	0700
081		FF	EE	RF	DD						1	1760	11	03	1400	1760	11	03	2200
082					DD						1	1775	06	17	1500	1775	06	17	1900
083					DD						1	1776	01	01	0400	1776	01	01	0900
084					DD						1	1776	10	28	0800	1776	10	28	1700
085		DE			DD						1	1776	12	26	0800	1776	12	26	0930
086		EE	LF		DD						1	1777	01	03	0800	1777	01	03	0815
087					DO	FF					1	1777	09	19	1245	1777	09	19	1915
088		DE			DO	FF					1	1777	10	04	0600	1777	10	04	1000
089					DO	FF					1	1777	10	07	1430	1777	10	07	1522
090					DD						1	1778	06	28	1000	1778	06	28	1700
091					DD						2	1780	08	16	0200	1780	08	16	0220
092					DO	DE					1	1781	01	17	0700	1781	01	17	0800
093					DO	FF					1	1781	03	15	1330	1781	03	15	1530
094					DO	FF					1	1781	04	25	1000	1781	04	25	1600

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
048	F	M	0				D	S	T	T									1
049	R	M	0				D	S	T	T									0
050	R	M	0				D	S	T	T									2
051	R	M	0				D	S	T	T									2
052	R	M	0				D	S	T	T									2
053	R	M	0				D	S	T	T									0
054	R	M	0				D	S	T	T									1
055	R	M	0				W	L	C	T									-1
056	R	M	0				D	S	T	T									-1
057	R	M	0				D	S	T	T									0
058	R	M	0				D	S	T	T									-1
059	R	M	0				D	S	T	T									1
060	R	M	0				D	S	T	T									1
061	R	M	0				D	S	T	T									2
062	R	M	0				D	S	T	T									1
063	R	M	0				W	L	C	T									-1
064	R	M	0				D	S	T	T									1
065	R	M	0				D	S	T	T									1
066	R	M	0				W	H	T	E									-1
067	R	M	0				D	S	T	T									1
068	R	M	0				D	S	H	T									0
069	R	M	0				D	S	T	T									-1
070	R	M	0				W	L	T	T									1
071	F	M	0				D	S	T	T									1
072	R	M	0				D	S	T	T									1
073	R	M	0				W	L	T	T									0
074	R	M	0				D	S	T	T									0
075	R	M	0				W	H	T	T									1
076	R	B	0				D	S	H	T									0
077	R	M	0				D	S	T	T									0
078	R	M	0				D	S	T	T									0
079	R	M	0				W	L	T	T									0
080	R	M	0				D	S	T	T									-1
081	R	M	0	R	W		W	L	C	T									0
082	R	M	0				D	S	T	T									0
083			U				W	L	C	T									0
084	R	M	0				D	S	T	T									0
085			U				W	L	C	T									3
086	R	M	0				D	O	C	T									2
087	R	M	0				D	S	T	T									-1
088			U				W	L	T	T									1
089	R	M	0				D	S	T	T									-1
090	R	M	0				D	S	H	T									0
091	R	M	0				D	S	T	T									1
092	R	M	0				D	S	T	T									-1
093	R	W	0				D	S	T	T									0
094	R	M	0				D	S	T	T									0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
048	1	0	1	0	0	2	1
049	1	0	0	0	0	0	-1
050	0	0	0	0	-1	2	1
051	0	0	0	0	0	2	1
052	0	0	0	0	-1	2	1
053	0	0	0	0	-1	0	1
054	1	0	0	0	1	1	1
055	0	0	0	0	0	0	-1
056	0	0	0	0	0	-1	-1
057	0	0	0	0	-1	0	1
058	0	0	0	0	0	-1	-1
059	0	0	0	0	0	1	1
060	0	0	0	0	0	1	1
061	0	0	0	0	0	2	1
062	-2	0	2	0	0	1	1
063	-2	0	0	0	0	-1	-1
064	0	0	0	0	0	1	1
065	0	0	0	0	-1	2	1
066	-1	0	0	-2	0	-1	-1
067	0	0	0	0	-1	-1	-1
068	0	0	2	0	-1	0	1
069	-1	0	-1	0	-1	-3	-1
070	0	0	1	0	1	2	1
071	0	0	1	0	-1	1	1
072	1	0	0	0	-1	1	1
073	0	0	1	0	-1	0	1
074	0	0	-1	0	-2	0	-1
075	0	0	0	0	-1	1	1
076	0	0	-1	0	-1	0	-1
077	0	0	0	0	0	0	-1
078	0	0	1	0	2	0	1
079	0	0	0	1	0	0	1
080	0	0	0	0	0	-1	-1
081	0	0	1	-1	-1	0	1
082	2	0	-1	0	-1	0	1
083	-2	0	0	1	0	0	-1
084	2	0	0	0	-1	0	1
085	0	0	2	1	0	2	1
086	0	0	2	1	0	1	1
087	0	0	-1	0	0	-1	0
088	0	0	0	1	0	1	-1
089	0	0	0	0	-1	-1	-1
090	0	0	0	0	-1	-1	0
091	1	0	0	0	0	1	1
092	0	0	0	0	-1	-1	-1
093	1	0	-2	0	-1	0	1
094	0	0	2	0	0	0	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
095	0.40	0.40	1	HD	PD	0	1	0	1	0	2200	1	2200	0	554	1646	2000	1	2000
096	7.00	8.00	0	HD		0	0	0	0	0	34000	1	34000	0	350	33650	36000	1	36000
097	5.00	6.40	0	PD		0	0	0	0	0	40000	1	40000	0	3000	37000	13000	1	13000
098	13.00	12.00	0	PD		0	0	0	0	0	45000	1	45000	0	4000	41000	43000	1	43000
099	8.00	5.60	0	PD		0	0	0	0	0	42000	1	42000	0	3000	39000	13000	1	13000
100	16.00	16.00	0	PD		0	0	0	1	0	44000	1	44000	0	4500	39500	23000	1	23000
101	16.00	20.00	0	HD		0	0	0	0	0	46000	1	46000	0	4000	42000	73000	1	73000
102	1.60	2.40	0	HD		0	0	0	2	0	17000	3	6100	10900	900	16100	10000	1	10000
103	2.40	4.00	0	HD		0	0	0	1	0	30000	3	21000	9000	1500	28500	25000	1	25000
104	40.00	40.00	0	HD		0	0	0	1	0	40000	1	40000	0	3000	37000	45000	1	45000
105	20.00	13.00	0	HD		0	0	0	0	0	44000	3			1500	42500	30000	1	30000
106	5.00	5.00	2	HD	PD	0	0	0	1	0	17300	1	17300	0	4500	12800	12700	1	12700
107	6.00	8.00	1	HD	PD	1	0	0	0	0	28000	1	28000	0	14000	14000	20500	3	
108	5.00	6.20	1	HD	PD	1	0	0	0	0	25000	1	25000	0	300	24700	21000	1	21000
109	17.00	14.00	0	HD		0	0	0	0	0	38000	1	38000	0	4500	33500	50000	1	50000
110	15.00	6.40	0	HD		0	0	0	0	0	35000	1	35000	0	6500	28500	4500	3	2000
111	8.00	10.00	1	PD	FD	1	1	0	0	0	40000	1	40000	0	3400	36600	25000	1	25000
112	13.00	11.60	0	PD		0	0	0	0	0	50000	1	50000	0	9000	41000	35000	1	35000
113	14.00	32.00	1	PD	FD	1	1	0	1	0	35000	1	35000	0	4000	31000	23000	1	23000
114	16.00	16.00	0	HD		0	0	0	0	0	60000	1	60000	0	4000	56000	60000	1	60000
115	4.00	6.80	0	HD		0	0	0	1	0	31000	1	31000	0	11000	20000	29000	3	9000
116	18.00	18.00	0	HD		0	0	0	0	0	57000	1	57000	0	20000	37000	55000	3	33000
117	13.00	11.20	0	HD		0	0	0	-3	0	85400	1	85400	0	27500	57900	73200	3	65200
118	9.00	9.00	0	HD		0	0	0	0	0	96000	3	46000	50000	4000	92000	53000	3	38000
119	6.00	8.00	0	HD		0	0	0	-1	0	63500	3	47900	15600	20000	43500	27000	3	20800
120	8.00	8.00	0	HD		0	0	0	0	0	78000	3	48900	29100	18500	59500	80000	3	71000
121	11.00	11.00	0	HD		0	0	0	1	0	80000	3	17000	63000	8000	72000	60000	1	60000
122	3.20	3.00	0	PD		0	0	0	0	0	13050	1	13050	0	1800	11250	19600	1	19600
123	5.00	4.00	0	FD		0	0	0	0	0	20600	1	20600	0	1600	19000	14800	1	14800
124	18.00	18.00	0	HD		0	0	0	0	0	74000	1	74000	0	12000	62000	66000	3	36000
125	7.50	5.00	0	HD		0	0	0	1	0	99000	1	99000	0	23000	76000	66000	3	23000
126	11.50	10.00	0	HD		0	0	0	0	0	35000	1	35000	0	4000	31000	37000	1	37000
127	24.00	24.00	0	HD		0	0	0	1	0	140000	3			34000	106000	140000	3	
128	4.80	4.80	0	PD		0	0	0	0	0	46000	1	46000	0	7300	38700	54500	1	54500
129	12.00	12.00	2	HD	PD	0	0	0	0	0	65900	1	65900	0	4500	61400	51910	1	51910
130	6.40	6.40	0	PD		0	0	0	0	0	48260	1	48260	0	2700	45560	37360	1	37360
131	4.80	4.80	0	HD		0	0	0	2	0	23000	1	23000	0	8000	15000	30000	1	30000
132	6.40	6.00	0	HD		0	0	0	0	0	46000	1	46000	0	6000	40000	42000	1	42000
133	11.00	11.00	0	HD		0	0	0	0	0	79062	1	79062	0	5148	73914	68024	1	63024
134	6.00	7.60	1	HD	PD	1	0	0	0	0	120000	1	120000	0	28000	92000	120000	1	120000
135	8.00	8.00	0	HD		0	0	0	1	0	93000	1	93000	0	18000	75000	120000	3	45000
136	9.60	11.20	1	HD	PD	1	1	1	0	0	199000	3	115000	84000	25000	174000	97000	1	97000
137	13.00	13.00	1	HD	PD	1	1	0	0	0	170000	3	158000	12000	40000	130000	120000	3	70000
138	13.60	20.80	0	HD		0	0	0	1	0	365000	3	200000	165000	65000	300000	196200	3	177500
139	1.60	3.20	0	HD		0	0	0	0	0	60000	3	30000	30000	5000	55000	40000	1	40000
140	4.80	9.60	2	HD	PD	0	0	0	1	0	110000	3	78000	32000	6000	104000	40000	1	40000
141	6.40	10.40	0	HD		0	0	0	-2	0	47600	3	37600	10000	6000	41600	85000	1	85000

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
095	0	693	1307	0	0	0	0	4	0	0	4	0	0	0	0	0	5	0	0	1	0
096	0	400	35600		0	0	0	58	0	0		0	2000	0	0	0	54	0	0		0
097	0	2500	10500	3000	0	0	0	100	0	0		0		0	0	0	54	0	0		0
098	0	3000	40000	6000	0	0	0	45	0	0	30	0	10000	0	0	0		0	0		0
099	0	3000	10000	5000	0	0	0	40	0	0		0	2200	0	0	0		0	0	6	0
100	0	3000	20000		0	0	0		0	0		0		0	0	0		0	0		0
101	0	7000	66000	14000	0	0	0		0	0		0	10000	0	0	0		0	0		0
102	0	1850	8150		0	0	0	24	0	0	0	0		0	0	0	18	0	0	16	0
103	0	3000	22000		0	0	0	60	0	0	8	0		0	0	0	30	0	0	20	0
104	0	3000	42000		0	0	0		0	0		0		0	0	0		0	0		0
105	0	3000	27000	13000	0	0	0		0	0		0	5000	0	0	0		0	0		0
106	0	7000	5700		0	0	0	32	0	0	0	0		0	0	0	37	0	0	11	0
107		5000	15500		0	0	0	35	0	0		0		0	0	0	20	0	0	0	0
108	0	5000	16000		0	0	0	30	0	0	0	0		0	0	0	40	0	0	20	0
109	0	6000	44000	5000	0	0	0		0	0		0	12000	0	0	0		0	0		0
110	2500	60	4440	25000	0	0	0	2	0	0	2	0		0	0	0	18	0	0	0	0
111	0	1600	23400	9400	0	0	0		0	0		0	5000	0	0	0		0	0		0
112	0	11000	24000	9000	0	0	0		0	0		0	2000	0	0	0		0	0	18	0
113	0	8000	15000	3500	0	0	0		0	0		0	3500	0	0	0	100	0	0	100	0
114	0	5000	55000	10000	0	0	0		0	0		0	15000	0	0	0		0	0		0
115	20000	7000	22000	7600	0	0	0	100	0	0	40	0	7000	0	0	0	29	0	0	13	0
116	22000	2500	52500	12000	0	0	0		0	0	90	0	12000	0	0	0		0	0		0
117	8000	7000	66200	16000	0	0	0	278	0	0	180	0	21960	0	0	0	139	0	0	0	0
118	15000	30000	23000	12500	0	0	0	114	0	0	0	0	11130	0	0	0	120	0	0	112	0
119	6200	4000	23000		0	0	0	230	0	0		0		0	0	0	40	0	0		0
120	9000	28000	52000	20000	0	0	0	210	0	0		0	18000	0	0	0	460	0	0	23	0
121	0	25000	35000		0	0	0	110	0	0	0	0		0	0	0	185	0	0	80	0
122	0	750	18850	1950	0	0	0	23	0	0	14	0	240	0	0	0	18	0	0	0	0
123	0	1000	13800	4500	0	0	0	40	0	0		0	0	0	0	0	9	0	0	4	0
124	30000	6000	60000	8000	0	0	0		0	0	12	0	10000	0	0	0		0	0		0
125	43000	21000	45000	14500	0	0	0	264	0	0	6	0	11000	0	0	0	144	0	0	3	0
126	0	6211	30789	6000	0	0	0		0	0		0	9000	0	0	0		0	0	2	0
127		45000	95000	30000	0	0	0	554	0	0		0	15000	0	0	0	480	0	0		0
128	0	6700	47800	8500	0	0	0	80	0	0	7	0	8950	0	0	0	60	0	0		0
129	0	1300	50610	8400	0	0	0	114	0	0		0	5000	0	0	0	60	0	0		0
130	0	1800	35560	4660	0	0	0	38	0	0		0	1870	0	0	0	48	0	0		0
131	0	7500	22500	4000	0	0	0		0	0		0	3700	0	0	0		0	0	1	0
132	0	13000	29000	6000	0	0	0	60	0	0	0	0	4000	0	0	0	78	0	0	20	0
133	0	7000	61024	8317	0	0	0	90	0	0	0	0	10002	0	0	0	143	0	0	143	0
134	0	40000	80000	28000	0	0	0	587	0	0	13	0	18000	0	0	0	640	0	0	40	0
135	75000	22000	98000	25000	0	0	0	500	0	0		0	7500	0	0	0	250	0	0		0
136	0	20000	77000	15000	0	0	0	300	0	0		0	26000	0	0	0	450	0	0		0
137	50000	10000	110000	20000	0	0	0	400	0	0	40	0	10000	0	0	0	250	0	0		0
138	18700	60000	136200	60000	0	0	0	1384	0	0		0	30000	0	0	0	717	0	0	325	0
139	0	15000	25000	12000	0	0	0	140	0	0	5	0	7000	0	0	0	138	0	0		0
140	0	6000	34000		0	0	0	100	0	0		0		0	0	0	70	0	0	50	0
141	0	4000	81000		0	0	0	100	0	0		0		0	0	0	160	0	0		0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
095	-2	0	0	0	0	0	1	-1	0	0	0	0	1	1	0	0	-1	0	FF	
096	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	-1	FF	
097	-1	0	0	0	1	4	1	0	0	0	0	1	0	0	1	0	0	0	FF	
098	-1	0	0	0	0	0	1	-1	0	-2	0	0	-1	0	0	0	-1	0	FF	EE
099	-1	0	0	0	1	2	1	0	1	0	0	2	0	0	0	0	0	0	FF	
100	-1	0	1	0	1	3	1	0	1	0	0	0	0	1	1	0	0	0	FF	DE
101	-1	0	0	0	0	0	2	0	-1	0	0	-2	0	0	0	0	0	-1	FF	
102	1	0	1	0	1	2	1	0	1	0	0	0	0	1	1	0	0	0	FF	PP
103	1	0	0	0	1	2.5	1	0	0	0	0	0	1	1	0	0	0	0	EE	LR
104	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	FF	EE
105	0	0	1	0	0	3	1	0	1	1	0	0	1	0	0	0	0	0	FF	EE
106	1	0	0	0	0	3	1	0	1	0	0	0	0	1	1	0	0	0	FF	DD
107	0	0	0	0	0	-3.2	1	0	-1	0	0	0	-1	0	0	0	0	-1	FF	
108	1	0	0	1	1	3	1	1	0	0	0	0	0	0	0	0	0	0	DO	
109	0	0	0	0	1	0	1	0	-1	-1	0	-1	0	0	0	0	0	0	FF	EE
110	-1	0	0	-1	0	0	1	-1	-1	0	0	0	0	0	0	0	0	0	FF	
111	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	-1	-1	FF	
112	0	0	0	0	0	2	1	0	1	1	0	0	0	0	0	0	0	0	FF	
113	0	0	0	0	1	8	1	0	0	0	0	0	1	1	0	0	0	0	RC	FF
114	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	FF	EE
115	0	0	0	0	-1	-3	1	0	-1	0	0	0	0	0	0	0	0	0	FF	
116	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	FF	EE
117	-1	1	1	0	-1	-7	1	-1	0	-1	0	0	-1	-2	0	0	0	0	FF	EE
118	1	0	0	0	1	12	1	1	1	1	0	0	1	0	1	0	0	0	FF	EE
119	-1	0	0	0	0	-6	1	-1	0	0	0	1	-1	-1	0	0	0	0	FF	EE
120	1	0	0	0	0	3.8	2	1	1	0	0	0	0	0	0	0	0	0	FF	EE
121	1	0	0	0	1	8	1	1	1	1	0	0	0	1	0	0	0	0	FF	EE
122	0	0	0	0	0	0	1	0	-1	0	0	-1	0	0	0	0	-1	0	FF	EE
123	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	-1	0	FF	
124	0	0	0	0	0	-1	1	0	-2	0	0	0	0	0	0	0	0	0	FF	
125	0	1	0	0	1	0	1	0	1	0	0	0	0	1	0	1	0	-1	FF	DE
126	1	0	1	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	FF	EE
127	0	0	0	0	1	6	1	0	0	1	0	0	0	0	1	0	0	0	EE	LF
128	0	0	0	0	0	0	2	0	-1	0	0	-1	0	0	0	0	-1	0	FF	EE
129	0	0	1	0	1	0	2	0	0	1	0	0	0	0	0	0	0	0	FF	
130	0	0	0	0	0	-2.4	2	0	-1	1	0	0	0	0	0	0	0	0	FF	EE
131	0	0	0	0	1	0	2	0	-1	0	0	-1	0	1	0	0	0	0	EE	RF
132	0	0	0	0	1	1	1	0	1	0	0	0	1	0	0	0	0	0	FF	
133	1	0	1	0	1	2	1	1	0	0	0	0	1	0	0	0	0	0	FF	DE
134	1	0	0	0	1	2	1	1	0	0	0	0	0	0	1	0	-1	0	FF	
135	0	0	0	0	0	0	1	1	-1	0	0	-1	0	1	0	0	0	0	FF	
136	0	0	0	0	1	10	1	-1	0	0	0	0	1	0	0	0	0	0	FF	EE
137	0	0	0	0	0	-10	1	0	-1	0	0	0	0	0	0	0	-1	0	FF	
138	0	0	1	0	1	12	1	0	1	0	0	0	0	0	0	0	0	0	FF	
139	0	0	1	0	1	4	1	0	0	1	0	0	0	0	0	0	0	0	FF	EE
140	0	0	1	0	1	1	1	0	1	0	0	1	0	1	0	0	-1	0	FF	
141	0	-1	0	0	0	0	1	-1	-1	0	0	-1	0	-2	0	0	0	0	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
095					DD						1	1781	09	08	0905	1781	09	08	1300
096					DD						1	1792	09	20	1210	1792	09	20	1700
097		EE			DD						1	1792	11	06		1792	11	06	
098					DO						1	1793	03	18		1793	03	18	
099		EE			DD						1	1793	09	06		1793	09	06	
100		PP			DD						1	1793	10	15		1793	10	16	
101					DD						1	1794	06	26	0400	1794	06	26	1000
102	RC				DD						1	1796	05	10	1830	1796	05	10	2000
103		FE			DD			DO			1	1796	08	05		1796	08	05	
104					DD						1	1796	08	11		1796	08	11	
105					DD						1	1796	09	03	0900	1796	09	03	1920
106					DD						1	1796	11	15		1796	11	17	
107		EE			DO			DD			1	1797	01	14		1797	01	15	
108		FF			DD						1	1798	07	21	1530	1798	07	21	1630
109					DD						1	1799	03	25	0500	1799	03	25	2000
110					DO						1	1799	04	16	0630	1799	04	16	1630
111		EE			DD			DD			1	1799	06	04		1799	06	04	
112					DD						2	1799	08	15	0300	1799	08	15	1300
113	EE				DO						1	1799	09	24		1799	09	25	
114					DD						1	1800	05	05		1800	05	05	
115					DO						2	1800	06	14	0900	1800	06	14	1200
116					DO						1	1800	12	03	0800	1800	12	03	1730
117	LF				DO	FF					1	1805	12	02	0800	1805	12	02	1700
118	RF				DO	FF					1	1806	10	14	0600	1806	10	14	1515
119	RF				DO	EE	RF				1	1806	10	14	0800	1806	10	14	1600
120	RF				DO						1	1807	02	08	0800	1807	02	08	2200
121	RF				DO	FF					1	1807	06	14	1730	1807	06	14	2300
122	LF				DD						1	1808	08	21	1000	1808	08	21	1930
123					DD						1	1809	01	16	1400	1809	01	16	1800
124					DO	EE	LF				1	1809	04	22	1330	1809	04	22	1930
125					DD						3	1809	05	21	1300	1809	05	21	2030
126	LF				DD						1	1809	06	14	1400	1809	06	14	1700
127		FF			DO	EE	LF				2	1809	07	05	1900	1809	07	05	2030
128	LF				DD						2	1809	07	28	0500	1809	07	28	0540
129					DD						1	1810	09	27	0545	1810	09	27	1400
130	RF				DO	FF					1	1811	05	05	0700	1811	05	05	1400
131		FF			DD						1	1811	05	16	0900	1811	05	16	1450
132					DO	FF					1	1812	07	22	1700	1812	07	22	2045
133					DO	FF					1	1813	06	21	0830	1813	06	21	1930
134		EE	LF		DO	FF					1	1812	09	07	0600	1812	09	07	1800
135					DO	FF					1	1813	05	02	1145	1813	05	02	2100
136	RR				DD						2	1813	05	20	1500	1813	05	20	2000
137					DO	DE					3	1813	08	26	0500	1813	08	26	1100
138					DO	PP					3	1813	10	16	0830	1813	10	16	1830
139	LF				DD						2	1813	10	30	0900	1813	10	30	1730
140					DO	FF					1	1814	02	01	1300	1814	02	01	2000
141					DO	FF					3	1814	03	09	0600	1814	03	09	1700

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
095	F	M	0				D	S	T	T									0
096	R	M	0				D	O	T	T									0
097	R	M	0				D	S	T	T									0
098	R	M	0				D	S	T	T									0
099	R	M	0				D	S	T	T									0
100	R	M	0				D	S	T	T									0
101	R	M	0				D	S	T	T									0
102	R	M	0				D	S	T	T									1
103	R	M	0				D	S	T	T									1
104	R	M	0				W	H	T	T									1
105	R	M	0				D	S	T	T									1
106	R	M	0				D	S	T	T									1
107	G	M	0	R	M		D	O	T	T									-1
108	F	D	0				D	S	H	T	D	S	H	D					1
109	G	W	0	R	W		D	S	T	T									-1
110	R	B	0				D	S	H	T	D	S	H	D					-1
111	G	M	0	R	M		D	S	T	T									0
112	R	M	0	G	M		D	S	T	T									0
113	R	M	0	G	M		D	O	T	T									1
114	F	W	0				D	S	T	T									0
115	R	M	0				D	S	T	T									-1
116	R	W	0	R	M		W	H	T	T									0
117	R	M	0				D	S	T	T									-2
118	R	M	0				D	S	T	T									2
119	R	M	0				D	S	T	T									-2
120	R	M	0				W	H	C	T									0
121	R	M	0				D	S	T	T									1
122	R	M	0				D	S	T	T									-1
123	R	M	0				D	S	T	T									0
124	R	M	0	G	M		D	S	T	T									-1
125			U	R	M		D	S	T	T									0
126	R	M	0	G	M		D	S	T	T									0
127	R	M	0				D	S	T	T									1
128	R	M	0	G	M		D	S	T	T									-1
129	G	B	0				D	S	T	T									-1
130			U	R	M		D	S	T	T									-1
131	R	M	0				D	S	T	T	W	H	T	T					0
132	R	M	0				D	S	T	T									1
133	R	M	0				D	S	T	T									1
134	R	M	0				D	S	T	T									1
135	R	M	0				D	S	T	T									-1
136	R	M	0				W	L	T	T									1
137	R	M	0				D	S	T	T									-1
138	R	M	0				D	S	T	T									-1
139	R	M	0				D	S	T	T									2
140	R	M	0				W	H	T	T									-1
141	R	M	0				D	S	T	T									0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
095	-2	0	2	0	0	0	-1
096	1	-1	0	0	0	-1	-1
097	-1	1	0	0	0	0	1
098	-1	1	0	0	0	0	-1
099	-1	1	0	0	0	0	1
100	-1	1	0	0	0	0	1
101	-1	1	-1	0	0	0	-1
102	0	1	0	0	0	2	1
103	0	0	0	0	0	2	1
104	0	0	1	-2	-1	1	1
105	0	0	0	0	0	1	1
106	0	0	0	0	0	1	1
107	0	0	0	0	-1	-2	-1
108	1	0	0	-1	-1	1	1
109	0	0	0	0	0	-1	-1
110	-1	0	0	0	0	-1	-1
111	0	0	0	0	0	0	-1
112	0	0	0	0	0	0	1
113	0	1	0	0	0	1	1
114	0	0	0	0	0	0	1
115	0	0	1	0	0	-1	-1
116	0	0	0	-1	-1	0	-1
117	0	0	-1	0	0	-2	-1
118	1	0	0	0	0	4	1
119	-1	0	0	0	0	-2	-1
120	0	0	-1	0	0	0	0
121	0	0	1	0	0	1	1
122	0	0	0	0	0	-1	-1
123	0	0	0	0	0	-1	-1
124	0	0	0	0	0	-1	-1
125	0	0	0	0	0	0	1
126	1	0	0	0	0	1	1
127	0	0	1	0	0	1	1
128	0	0	0	0	0	-1	-1
129	0	0	0	0	-1	-1	-1
130	0	-1	0	0	-1	-1	-1
131	0	0	1	0	0	0	-1
132	0	0	0	0	0	2	1
133	0	0	0	0	0	2	1
134	0	0	0	0	0	1	1
135	1	0	1	0	0	-1	-1
136	-1	0	1	0	0	1	1
137	0	0	-1	0	0	-1	-1
138	0	0	0	0	0	-1	1
139	0	-1	0	0	0	2	1
140	1	1	2	1	0	-1	1
141	-1	0	-1	0	0	0	-1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
142	4.80	4.80	0	HD		0	0	0	2	0	80000	3	20000	60000	3000	77000	30000	3	16000
143	12.00	12.00	0	HD		0	0	0	0	0	67567	3	49567	18000	12000	55567	82895	1	82895
144	5.00	5.00	0	HD		0	0	0	0	0	26741	1	26741	0	4500	22241	33765	3	8000
145	4.00	6.40	1	HD	PD	1	0	0	-2	0	68265	1	68265	0	25000	43265	137547	3	68000
146	0.20	0.20	0	HD		0	0	0	0	0	3500	1	3500	0	29	3471	1800	1	1800
147	1.60	1.60	0	HD		0	0	0	0	0	2100	1	2100	0	604	1496	2650	1	2650
148	0.50	0.70	0	HD		0	0	0	0	0	2000	3	700	1300	860	1140	3000	3	1700
149	2.30	3.00	0	PD		0	0	0	0	0	6000	1	6000	0	2600	3400	3200	1	3200
150	1.50	1.50	0	HD		0	0	0	0	0	3000	1	3000	0	66	2934	3000	1	3000
151	3.20	2.50	0	HD		0	0	0	0	0	6400	1	6400	0	200	6200	5180	1	5180
152	7.50	7.50	0	HD		0	0	0	0	0	1800	1	1800	0	531	1269	2200	1	2200
153	1.00	1.00	0	HD		0	0	0	0	0	2500	1	2500	0	590	1910	2400	1	2400
154	1.40	1.40	0	HD		0	0	0	0	0	2000	1	2000	0	145	1855	2000	1	2000
155	4.50	4.50	0	HD		0	0	0	0	0	9310	1	9310	0	2500	6810	5780	1	5780
156	0.30	0.20	0	HD		0	0	0	3	0	743	1	743	0	39	704	1600	1	1600
157	1.20	1.60	0	HD		0	0	0	0	0	2288	1	2288	0	48	2240	6000	1	6000
158	1.90	2.70	0	HD		0	0	0	0	0	1700	1	1700	0	122	1578	5600	1	5600
159	7.00	13.00	0	HD		0	0	0	0	0	14000	1	14000	0	2000	12000	4759	1	4759
160	2.40	4.00	0	PD		0	0	0	2	0	8500	1	8500	0	431	8069	12000	1	12000
161	2.50	2.70	0	PD		0	0	0	2	0	4500	1	4500	0	60	4440	4000	1	4000
162	2.00	1.10	0	PD		0	0	0	0	0	8497	1	8497	0	996	7501	10500	1	10500
163	1.60	1.00	0	PD		0	0	0	0	0	3100	1	3100	0	792	2308	12000	1	12000
164	1.80	3.50	0	FD		0	0	0	0	0	7180	1	7180	0	863	6317	15000	1	15000
165	10.00	11.00	1	HD	PD	1	0	0	0	0	65000	1	65000	0	2562	62438	38400	1	38400
166	2.50	2.50	0	PD		0	0	0	1	0	42000	1	42000	0	15187	26813	16000	3	8500
167	8.00	6.00	0	HD		0	0	0	0	0	48090	1	48090	0	4530	43560	61618	1	61618
168	11.00	11.00	0	HD		0	0	0	0	0	143000	1	143000	0	17400	125600	130000	1	130000
169	12.00	24.00	0	HD		0	0	0	0	0	220000	3	105000	115000	9200	210800	215000	1	215000
170			0	HD		0	0	0	0	0	90000	3			8100	81900	75000	1	75000
171	4.50	4.00	0	HD		0	0	0	0	0	35000	1	35000	0	2896	32104	32500	3	30500
172	2.00	2.40	0	HD		0	0	0	2	0	5400	1	5400	0	1235	4165	10175	1	10175
173	1.00	1.00	0	HD		0	0	0	0	0	3144	1	3144	0	607	2537	5000	3	2500
174	0.60	0.80	0	HD		0	0	0	0	0	4000	1	4000	0	533	3467	4000	1	4000
175	1.10	1.10	0	HD		0	0	0	0	0	21000	1	21000	0	2000	19000	27000	1	27000
176	6.00	4.00	0	HD		0	0	0	0	0	16202	1	16202	0	1300	14902	10500	1	10500
177	0.80	0.80	0	HD		0	0	0	0	0	3087	1	3087	0	718	2369	7000	1	7000
178	6.00	8.00	0	HD		0	0	0	2	0	40355	1	40355	0	10699	29656	66812	3	41330
179	2.00	2.00	1	HD	WD	0	0	1	3	0	16000	1	16000	0	35	15965	1063	1	1063
180	1.60	1.60	0	HD		0	0	0	0	0	16000	1	16000	0	365	15635	7000	1	7000
181	2.80	2.80	0	HD		0	0	0	0	0	10500	1	10500	0	684	9816	5000	1	5000
182	2.40	2.40	0	HD		0	0	0	0	0	15000	3	1200	13800	800	14200	3000	1	3000
183	6.40	6.40	0	HD		0	0	0	0	0	41816	3	7580	34236	6100	35716	41797	3	8253
184	3.20	3.20	0	HD		0	0	0	0	0	16808	1	16808	0	1484	15324	15631	1	15631
185	3.60	3.60	0	HD		0	0	0	0	0	57018	3	21752	35266	8751	48267	34214	3	25214
186	3.20	3.20	0	HD		0	0	0	0	0	86748	3	11000	75748	4241	82507	83345	3	24635
187	1.60	3.20	0	HD		0	0	0	0	0	82507	1	82507	0	5355	77152	78902	1	78902
188	1.60	1.60	0	HD		0	0	0	0	0	8030	1	8030	0	2353	5677	16848	1	16848

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
142	12000	5000	25000		0	0	0	150	0	0		0	9000	0	0	0	40	0	0		0
143	0	18000	64895	13737	0	0	0	236	0	0	0	0	8630	0	0	0	216	0	0	21	0
144	25765	4500	29265	6106	0	0	0	72	0	0	0	0	2500	0	0	0	68	0	0	0	0
145	69547	22500	115047	15489	0	0	0	266	0	0	220	0	23880	0	0	0	198	0	0	0	0
146	0	668	1132		0	0	0		0	0	0	0		0	0	0		0	0		0
147	0	335	2315	200	0	0	0	6	0	0	2	0		0	0	0	4	0	0	0	0
148	1300	878	2122		0	0	0	16	0	0		0		0	0	0	9	0	0	2	0
149	0	71	3129		0	0	0	24	0	0		0		0	0	0	25	0	0	0	0
150	0	1800	1200		0	0	0	0	0	0	0	0	400	0	0	0	3	0	0	3	0
151	0	2908	2272	2500	0	0	0		0	0	0	0	1700	0	0	0		0	0		0
152	0	250	1950		0	0	0	0	0	0		0		0	0	0	2	0	0	2	0
153	0	340	2060	300	0	0	0	14	0	0	14	0	400	0	0	0	0	0	0		0
154	0	464	1536	2000	0	0	0	0	0	0		0	2000	0	0	0	0	0	0		0
155	0	919	4861		0	0	0	11	0	0	11	0		0	0	0	1	0	0	0	0
156	0	1600	0		0	0	0	0	0	0	0	0		0	0	0		0	0		0
157	0	400	5600		0	0	0	20	0	0	0	0	1000	0	0	0	12	0	0		0
158	0	600	5000		0	0	0	16	0	0	0	0		0	0	0	8	0	0	8	0
159	0	746	4013		0	0	0		0	0		0	1018	0	0	0	16	0	0	2	0
160	0	4000	6000		0	0	0	7	0	0	0	0		0	0	0	40	0	0	40	0
161	0	1513	2487		0	0	0		0	0	0	0		0	0	0	22	0	0	22	0
162	0	3124	7376		0	0	0		0	0	0	0		0	0	0		0	0		0
163	0	2700	9300	300	0	0	0	9	0	0	0	0		0	0	0		0	0		0
164	0	1800	13200		0	0	0	8	0	0	0	0		0	0	0	13	0	0	13	0
165	0	5709	30691	1000	0	0	0	136	0	0		0	3400	0	0	0	118	0	0		0
166	7500	4105	11895		0	0	0	106	0	0		0		0	0	0	56	0	0		0
167	0	10238	51382	1207	0	0	0	87	0	0		0	3435	0	0	0	152	0	0		0
168	0	21800	108200	15000	0	0	0	420	0	0		0		0	0	0	536	0	0		0
169	0	44300	170700	27000	0	0	0	780	0	0		0	24000	0	0	0	770	0	0	187	0
170	0	5600	69400	7000	0	0	0	192	0	0	14	0		0	0	0	172	0	0		0
171	2000	1982	30518		0	0	0	55	0	0	27	0	1300	0	0	0	49	0	0	0	0
172	0	1095	9080		0	0	0	16	0	0	5	0		0	0	0	15	0	0	0	0
173	2500	642	4358	0	0	0	0	6	0	0	0	0	0	0	0	0	6	0	0	6	0
174	0	262	3738		0	0	0	12	0	0	12	0		0	0	0	7	0	0	0	0
175	0	2609	24391		0	0	0	14	0	0	0	0		0	0	0		0	0		0
176	0	1384	9116		0	0	0	50	0	0	4	0		0	0	0	49	0	0	10	0
177	0	590	6410	290	0	0	0	30	0	0	0	0	750	0	0	0	24	0	0	0	0
178	25482	13047	53765		0	0	0	108	0	0	30	0		0	0	0	170	0	0	29	0
179	0	904	159	1700	0	0	0	48	0	0	0	0	0	0	0	0	2	0	0	2	0
180	0	2126	4874	1700	0	0	0	48	0	0	0	0		0	0	0	2	0	0	2	0
181	0	288	4712		0	0	0	30	0	0	0	0		0	0	0	16	0	0	0	0
182	0	1018	1982		0	0	0	12	0	0	0	0	150	0	0	0	16	0	0	8	0
183	33544	5000	36797		0	0	0		0	0	10	0		0	0	0		0	0		0
184	0	361	15270		0	0	0		0	0		0		0	0	0		0	0		0
185	9000	6837	27377		0	0	0		0	0		0		0	0	0		0	0		0
186	58710	4443	78902		0	0	0		0	0		0		0	0	0		0	0		0
187	0	3214	75688		0	0	0		0	0		0		0	0	0		0	0		0
188	0	1338	15510	1167	0	0	0		0	0		0	1200	0	0	0		0	0		0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
142	0	0	1	0	1	1	2	0	1	0	0	2	1	1	0	0	0	0	FF	
143	1	0	1	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0	FF	
144	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	FF	
145	0	0	1	0	1	-2	1	0	-1	0	0	-1	-1	-1	0	0	0	0	FF	
146	0	0	0	0	1	0.2	1	0	0	0	0	0	1	0	0	0	0	0	FF	
147	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	FF	
148	0	0	0	0	0	0	2	0	-1	0	0	0	0	0	0	0	0	0	FF	EE
149	0	0	0	0	0	0	1	0	0	0	0	0	0	0	-1	0	-1	0	FF	
150	1	0	0	0	1	0.5	1	0	0	0	0	0	0	0	0	0	0	0	FF	
151	0	0	0	0	1	2	1	0	0	0	0	0	1	0	0	0	0	0	FF	
152	0	0	0	0	1	0.5	2	0	0	0	0	0	1	0	0	0	0	0	FF	
153	0	0	0	0	1	-1	1	0	0	0	0	0	0	0	0	0	0	0	FF	
154	0	0	0	0	1	0.3	1	0	0	0	0	0	0	0	0	0	0	0	FF	EE
155	-1	0	0	0	0	0	1	0	-1	0	0	0	-1	0	0	0	0	0	FF	
156	1	0	0	0	1	0.3	1	1	0	0	0	-1	1	2	0	0	0	0	FF	
157	1	0	0	0	1	1.8	1	1	0	0	0	0	1	0	0	0	0	0	FF	
158	1	0	1	0	1	2.7	1	1	0	0	0	0	0	0	0	0	0	0	FF	
159	-1	0	0	0	1	0	1	-1	0	0	0	0	0	0	0	0	0	0	FF	
160	1	0	0	0	1	6	1	1	0	0	0	0	0	1	0	0	-1	0	FF	
161	0	0	0	0	1	1	1	0	0	0	0	0	1	1	0	0	-1	0	FF	
162	0	0	1	0	1	11.2	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
163	0	0	1	0	0	0.8	1	0	0	0	0	0	1	0	1	0	-1	0	FF	
164	0	0	1	0	1	4.5	1	0	0	0	0	0	1	0	0	0	-1	0	FF	
165	1	0	0	0	1	3	1	1	0	0	0	0	0	0	0	0	-1	0	FF	
166	-1	-1	0	0	0	0	1	-1	-1	0	0	1	0	1	0	0	-1	0	FF	
167	0	0	0	0	1		1	1	0	0	0	0	0	0	0	0	0	0	FF	
168	0	0	0	0	1	3	1	1	0	0	0	0	0	0	0	0	0	0	FF	
169	0	0	0	0	1	9	1	0	0	0	0	0	1	0	0	0	0	0	DE	FF
170	-1	0	0	0	0	0	1	-1	0	-1	0	0	-1	0	0	0	0	0	FF	
171	0	0	0	0	0	-3.2	1	0	-1	0	0	0	0	0	0	0	0	0	EE	LF
172	0	0	0	0	1	-1.2	1	0	0	0	0	-1	0	1	0	0	0	0	FF	
173	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	FF	
174	0	0	0	0	0	-0.2	1	0	0	0	0	0	0	0	0	0	0	0	FF	
175	0	-1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	FF	
176	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	EE	LR
177	0	0	0	0	0	0	1	0	-2	0	0	-2	-1	0	0	0	0	0	FF	
178	0	0	0	0	1	0	2	0	-1	0	0	-1	0	1	0	0	0	0	FF	
179	0	0	1	0	1	1	1	0	0	1	0	2	1	2	0	0	0	0	FF	DE
180	0	0	1	0	1	1.6	1	0	0	0	0	2	0	0	0	0	0	0	FF	EE
181	0	0	0	0	0	0	1	0	0	0	0	0	-1	0	0	0	0	0	FF	
182	0	0	0	0	0	1.6	1	0	2	0	0	2	1	0	0	0	0	0	FF	
183	0	0	0	0	1	1.6	2	0	0	0	0	0	0	0	0	0	0	0	FF	
184	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	FF	
185	0	0	0	0	1	0.5	2	0	0	0	0	0	0	0	0	0	0	0	FF	
186	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	FF	
187	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	FF	
188	0	0	0	0	1	0	1	0	-1	0	0	0	0	0	0	0	0	0	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
142					DO	FF					2	1814	03	20	1400	1814	03	20	1930
143		EE	RR		DD						1	1815	06	16	1400	1815	06	16	2130
144					DD						1	1815	06	16	1430	1815	06	16	2130
145					DO	FF	EE				1	1815	06	18	1130	1815	06	18	2130
146		EE	RF		DD						1	1813	10	05	1400	1813	10	05	1410
147					DO	FF	DE				1	1814	07	05	1700	1814	07	05	1800
148	LF				DD						1	1814	07	25	1800	1814	07	25	2400
149					DD						1	1815	01	08	0600	1815	01	08	0645
150					DD						1	1819	8	7		1819	8	7	
151		EE	RF		DD						1	1821	6	25		1821	6	25	
152		EE	RF		DD						1	1822	4	7		1822	4	7	
153					DO	FF					1	1822	5	24	900	1822	5	24	1200
154	RF				DO	FF					1	1824	8	6		1824	8	6	
155		EE	LF		DO	EE	LF				1	1824	12	9	900	1824	12	9	1900
156					DD						1	1836	4	21	1630	1836	4	21	1648
157					DO	DE					1	1846	5	8	1430	1846	5	8	1930
158					DD						1	1846	5	9	1600	1846	5	9	1730
159		EE	LR		DD						2	1847	2	22	1500	1847	2	22	1845
160		EE			DD						2	1847	4	17	1200	1847	4	17	1900
161		EE	LR		DD						1	1847	8	20	545	1847	8	20	602
162		EE	RR		DD						2	1847	8	20	800	1847	8	20	830
163		EE	LF		DD						1	1847	9	8	500	1847	9	8	700
164		EE	RR		DD						1	1847	9	13	550	1847	9	13	1650
165					DD						1	1854	9	20	1430	1854	9	20	1730
166					DO	FF					1	1854	11	5	545	1854	11	5	1300
167					DO	FF		EE			1	1859	6	4	1030	1859	6	4	1930
168					DO	FF					1	1859	6	24	700	1859	6	24	1830
169					DO	FF					1	1866	7	3	900	1866	7	3	1700
170					DO	FF					1	1866	6	24	800	1866	6	24	1700
171		FF			DO						1	1861	7	21	900	1861	7	21	1600
172		EE	LR		DO						1	1861	8	10	530	1861	8	10	1130
173					DO	EE	LF				1	1861	11	7	1030	1861	11	7	1650
174					DO	DE					1	1862	1	19	530	1862	1	19	1600
175					DO						1	1862	2	15	550	1862	2	15	1530
176		EE	RF		DO						2	1862	3	7	1030	1862	3	7	1630
177					DO						2	1862	3	23	600	1862	3	23	800
178					DO	FF					2	1862	4	6	500	1862	4	6	1800
179					DD						1	1862	5	23	1400	1862	5	23	1730
180	RF				DD						1	1862	5	25	600	1862	5	25	730
181					DO	FF					1	1862	6	8	900	1862	6	8	1200
182		EE	LF		DO	FF					1	1862	6	9	700	1862	6	9	1100
183					DD						2	1862	5	31	1300	1862	5	31	1930
184					DD						1	1862	6	26	1500	1862	6	26	2100
185		EE	RF		DD						2	1862	6	27	1230	1862	6	27	1800
186					DD						3	1862	6	29	900	1862	6	29	1100
187					DD						2	1862	7	1	1500	1862	7	1	1600
188					DO	FF					1	1862	8	9	1500	1862	8	9	2130

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
142	R	M	0				D	S	T	T									0
143	R	M	0				W	L	T	T									1
144	R	M	0				W	L	T	T									-1
145	R	M	0				W	L	T	T	D	S	T	T					0
146	F	W	0				D	S	T	T									1
147	R	M	0				D	S	T	T									0
148	R	M	0				D	S	T	T									0
149	F	M	0				D	S	T	T									-1
150	R	M	0				D	S	T	T									2
151	R	M	0				D	S	T	T									1
152	G	M	0				D	S	T	T									0
153	G	M	0				D	S	T	T									-1
154	F	M	0				D	S	T	T									1
155	R	M	0				D	S	T	T									-1
156	F	M	0	R	M		D	S	T	T									1
157	F	B	0				D	S	H	T	D	S	H	D					2
158	F	M	0				D	S	H	T	D	S	H	D					1
159	G	B	0				W	L	T	T	W	L	T	D					-2
160	G	M	0				D	S	H	T									2
161	G	B	0				D	S	H	T									2
162	F	B	0				D	S	H	T									1
163	R	M	0				D	S	H	T									1
164	G	M	0				D	S	H	T									1
165	R	B	0				D	S	T	T									0
166	R	B	0				W	H	C	T									0
167	F	B	0				D	S	H	T									0
168	R	M	0				D	S	H	T									0
169	R	M	0				W	H	T	T									1
170	R	M	0	G	M		D	S	T	T									-1
171	R	M	0				D	S	T	T									-1
172	R	M	0				D	S	T	T									0
173	F	M	0				D	S	T	T									1
174	R	M	0				W	L	T	T									-1
175	R	M	0				D	S	C	T									-1
176	R	M	0				D	S	T	T									0
177	R	M	0				D	S	T	T									1
178	R	M	0				D	S	T	T									0
179	R	M	0				D	S	T	T									1
180	R	M	0				D	S	T	T									1
181	R	M	0				D	S	T	T									-1
182	R	M	0				D	S	T	T									1
183	R	M	0				D	S	T	T									0
184	R	M	0				D	S	T	T									0
185	R	M	0				D	S	T	T									0
186	R	M	0				D	S	T	T									0
187	R	M	0	G	M		D	S	T	T									0
188	R	M	0				D	S	T	T									-1

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
142	1	1	1	0	0	0	1
143	1	0	0	0	0	1	1
144	1	0	0	0	0	-1	-1
145	0	0	-1	-1	-1	0	-1
146	0	0	0	0	-1	1	1
147	0	0	0	0	0	0	-1
148	0	0	0	0	-1	0	-1
149	0	0	0	0	-1	-1	-1
150	0	0	0	0	-1	2	1
151	0	0	0	0	0	1	1
152	0	0	0	0	-1	0	1
153	0	0	0	0	-1	-1	-1
154	0	0	0	0	0	1	1
155	0	0	0	0	-1	-1	-1
156	0	0	1	0	0	1	1
157	1	0	0	0	0	1	1
158	1	0	0	0	-1	1	1
159	0	0	0	0	-1	-2	-1
160	1	0	0	0	-1	2	1
161	1	0	1	0	-1	1	1
162	1	0	0	0	-1	1	1
163	1	0	0	0	-1	1	1
164	1	0	0	0	-1	1	1
165	0	0	0	0	-1	0	1
166	-1	0	0	0	0	0	-1
167	0	0	0	0	0	0	1
168	0	0	0	0	-1	0	1
169	0	0	0	0	0	2	1
170	-1	0	0	0	-1	-1	-1
171	0	0	0	0	-1	-1	-1
172	0	0	0	0	0	0	-1
173	0	0	1	0	0	1	1
174	0	0	0	0	0	1	-1
175	0	0	0	0	0	-1	-1
176	0	0	-1	0	-1	-1	-1
177	0	0	-1	0	0	1	-1
178	0	0	0	0	0	0	-1
179	0	0	1	0	0	1	1
180	0	1	0	0	-1	2	1
181	0	0	0	0	0	-2	-1
182	0	0	0	0	0	1	1
183	0	0	0	0	0	0	-1
184	0	0	0	0	0	0	-1
185	0	0	0	0	-1	0	-1
186	0	0	0	0	0	0	-1
187	0	0	0	0	-1	0	-1
188	0	0	0	0	0	-2	-1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
189	4.00	2.40	0	HD		0	0	0	0	0	75696	3	35083	40613	14462	61234	48527	3	20000
190	3.00	2.00	0	HD		0	0	0	0	0	28480	1	28480	0	1813	26667	17852	1	17852
191	6.40	4.00	0	HD		0	0	0	0	0	90000	1	90000	0	12410	77590	46000	3	43000
192	4.00	3.40	0	PD		0	0	0	0	0	22000	1	22000	0	4233	17767	21147	1	21147
193	7.20	9.60	0	HD		0	0	0	0	0	36940	1	36940	0	4211	32729	16000	1	16000
194	7.80	13.20	0	PD		0	0	0	0	0	106007	1	106007	0	12653	93354	72497	1	72497
195	13.60	11.20	0	HD		0	0	0	2	0	34732	1	34732	0	11739	22993	41400	1	41400
196	6.80	15.60	0	HD		0	0	0	-3	0	113000	3	109480	3520	17278	95722	60892	1	60892
197	4.00	6.80	0	HD		0	0	0	0	0	29373	1	29373	0	2441	26932	20000	1	20000
198	4.40	3.60	0	HD		0	0	0	2	0	12000	3	10500	1500	900	11100	10000	1	10000
199	5.10	4.10	0	HD		0	0	0	0	0	75054	3	28800	46254	28063	46991	83289	3	23600
200	6.40	7.20	0	HD		0	0	0	2	0	66326	1	66326	0	18454	47872	58222	1	58222
201	4.80	7.20	1	PD	FD	0	1	1	0	0	61000	1	61000	0	5824	55176	40000	1	40000
202	8.40	6.40	0	HD		0	0	0	0	0	101895	3	74000	27895	17666	84229	61025	3	31000
203	5.20	7.60	1	HD	PD	1	0	1	0	0	90000	3	20000	70000	18399	71601	50000	3	14000
204	2.80	2.80	0	HD		0	0	0	0	0	5000	1	5000	0	577	4423	5150	1	5150
205	9.60	11.20	0	PD		0	0	0	0	0	107907	1	107907	0	11000	96707	59000	1	59000
206	15.60	15.60	0	PD		0	0	0	0	0	16225	1	16225	0	2051	14174	17733	1	17733
207	1.60	1.60	1	HD	PD	1	0	0	2	0	18832	1	18832	0	2746	16086	20139	1	20139
208	4.80	6.40	0	HD		0	0	0	2	0	36934	1	36934	0	8000	28934	30477	1	30477
209	4.00	4.00	0	FD		0	0	0	0	0	63797	3	16100	47697	8150	55647	41499	3	5400
210	2.40	2.40	0	HD		0	0	0	0	0	20289	3	11832	8457	4455	15834	14787	3	
211	3.60	4.80	1	HD	PD	1	1	1	1	0	37711	1	37711	0	5018	32693	17103	1	17103
212	4.80	6.40	0	HD		0	0	0	3	0	18410	1	18410	0	2910	15500	30829	1	30829
213	4.00	3.60	0	PD		0	0	0	0	0	26897	1	26897	0	6252	20645	27939	1	27939
214	6.60	8.00	0	PD		0	0	0	0	0	49773	1	49773	0	3061	46712	23207	1	23207
215	2.80	3.60	0	HD		0	0	0	2	0	27000	1	27000	0	2606	24394	60000	3	17990
216	2.40	2.40	1	HD	PD	1	0	0	0	0	45247	3	13000	32247	2781	42466	20030	3	3500
217	2.40	2.40	0	PD		0	0	0	0	0	30000	1	30000	0	634	29366	10000	1	10000
218	1.60	8.00	0	FD		0	0	0	0	0	13500	1	13500	0	400	13100	7000	1	7000
219	7.20	7.20	0	HD		0	0	0	0	0	30000	1	30000	0	1180	28820	21000	1	21000
220	5.00	2.50	0	HD		0	0	0	2	0	51000	1	51000	0	1600	49400	6000	1	6000
221	10.00	8.00	0	HD		0	0	0	0	0	82000	1	82000	0	10700	71300	41000	1	41000
222	6.00	2.50	2	HD	PD	0	0	0	0	0	42000	3	16000	26000	4900	37100	28000	3	13400
223	12.00	10.00	0	HD		0	0	0	0	0	91000	3	29000	34000	16000	47000	113000	1	113000
224	16.00	16.00	0	HD		0	0	0	0	0	187000	1	187000	0	20200	166800	113000	1	113000
225	13.00	13.00	0	HD		0	0	0	0	0	200000	1	200000	0	9000	191000	120000	1	120000
226	10.00	10.00	0	HD		0	0	0	0	0	60000	1	60000	0	1800	58200	20000	1	20000
227	60.00	60.00	0	HD		0	0	0	0	0	86000	1	86000	0	6300	79700	116000	1	116000
228	25.00	25.00	0	PD		0	0	0	0	0	72000	1	72000	0	4000	68000	68000	1	68000
229	7.50	15.00	0	PD		0	0	0	0	0	110000	1	110000	0	8000	102000	40000	1	40000
230	4.00	1.50	0	HD		0	0	0	2	0	20000	1	20000	0	3000	17000	1800	1	1800
231	2.00	1.50	0	HD		0	0	0	0	0	20000	1	20000	0	1500	18500	5317	1	5317
232	1.00	1.40	2	HD	PD	0	0	0	0	0	1200	1	1200	0	6	1194	350	1	350
233	6.40	6.40	0	PD		0	0	0	2	0	17401	1	17401	0	469	16932	20000	1	20000
234	3.20	4.40	0	HD		0	0	0	0	0	55000	1	55000	0	30700	24300	25800	1	25800
235	7.00	14.00	0	HD		0	0	0	2	0	120000	1	120000	0	17000	103000	20251	1	20251

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
189	28527	9474	39053		0	0	0		0	0		0	2768	0	0	0		0	0		0
190	0	2685	15167		0	0	0	27	0	0		0	700	0	0	0	7	0	0		0
191	3000	13700	32300	4500	0	0	0		0	0		0		0	0	0		0	0		0
192	0	2520	18627		0	0	0		0	0		0		0	0	0		0	0		0
193	0	3396	12604		0	0	0		0	0		0		0	0	0		0	0		0
194	0	4656	67841		0	0	0		0	0		0		0	0	0		0	0		0
195	0	12906	28494	4500	0	0	0	120	0	0	6	0	3200	0	0	0	100	0	0	28	0
196	0	12821	48071		0	0	0	404	0	0	120	0		0	0	0	170	0	0	7	0
197	0	3851	16149		0	0	0		0	0		0	500	0	0	0		0	0	30	0
198	0	500	9500	10500	0	0	0		0	0	3	0		0	0	0		0	0		0
199	59689	23049	60240	8000	0	0	0	250	0	0	3	0	13000	0	0	0	300	0	0	6	0
200	0	16170	42052	8000	0	0	0		0	0	15	0	10000	0	0	0	246	0	0	51	0
201	0	6667	33333		0	0	0		0	0		0	4856	0	0	0		0	0	40	0
202	30025	7750	53275	13003	0	0	0	318	0	0	2	0	7261	0	0	0	224	0	0		0
203	36000	10000	40000	12000	0	0	0	274	0	0		0	7000	0	0	0	200	0	0	18	0
204	0	831	4319	900	0	0	0	14	0	0	0	0	1000	0	0	0	22	0	0	5	0
205	0	1500	57500	12976	0	0	0		0	0		0		0	0	0		0	0		0
206	0	442	17291		0	0	0	200	0	0		0		0	0	0		0	0		0
207	0	1600	18539		0	0	0		0	0		0		0	0	0		0	0		0
208	0	3722	26755	7150	0	0	0		0	0		0		0	0	0		0	0	13	0
209	36099	4752	36747		0	0	0		0	0		0	1624	0	0	0		0	0		0
210		1619	13168		0	0	0		0	0		0		0	0	0	30	0	0		0
211	0	3921	13182	10000	0	0	0	100	0	0		0	5135	0	0	0		0	0	5	0
212	0	5665	25164	3864	0	0	0	40	0	0	24	0	7929	0	0	0		0	0	0	0
213	0	2326	25613	5000	0	0	0		0	0		0	6400	0	0	0	60	0	0	8	0
214	0	5350	17857	11643	0	0	0	170	0	0		0	1080	0	0	0	156	0	0	69	0
215	42010	1646	58354	5000	0	0	0		0	0		0	4500	0	0	0		0	0	4	0
216	16530	1800	18230	11815	0	0	0		0	0		0	5700	0	0	0		0	0		0
217	0	6000	4000	11500	0	0	0		0	0		0		0	0	0	10	0	0	10	0
218	0	4000	3000		0	0	0	8	0	0	0	0		0	0	0		0	0	32	0
219	0	7000	14000		0	0	0		0	0		0		0	0	0	0	0	0	0	0
220	0	2100	3900	3100	0	0	0	144	0	0	0	0	900	0	0	0	18	0	0	1	0
221	0	20300	20700	5800	0	0	0	300	0	0	0	0	6000	0	0	0	131	0	0	33	0
222	14600	3100	24900	4500	0	0	0	108	0	0	0	0	3500	0	0	0	90	0	0	0	0
223	0	14000	99000	11000	0	0	0	486	0	0	0	0	14000	0	0	0	228	0	0	1	0
224	0	12800	100200	21000	0	0	0	732	0	0	0	0	13000	0	0	0	520	0	0	0	0
225	0	38000	82000	24000	0	0	0	701	0	0	0	0	12000	0	0	0	564	0	0		0
226	0	1800	18200		0	0	0	150	0	0	0	0	5000	0	0	0	100	0	0	2	0
227	0	28000	88000	14800	0	0	0	459	0	0		0	16000	0	0	0	432	0	0	83	0
228	0	26000	62000		0	0	0	324	0	0	0	0		0	0	0		0	0	17	0
229	0	2000	38000	9000	0	0	0	146	0	0		0	4500	0	0	0	364	0	0		0
230	0	1445	355	0	0	0	0	0	0	0	0	0	450	0	0	0	2	0	0	2	0
231	0	100	5217	0	0	0	0	0	0	0	0	0	899	0	0	0	12	0	0	0	0
232	0	284	66	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
233	0	2500	17500	2785	0	0	0	61	0	0		0		0	0	0	75	0	0		0
234	0	482	25318		0	0	0	0	0	0		0		0	0	0	80	0	0		0
235	0	9678	10573	17000	0	0	0	42	0	0	0	0	0	0	0	0	64	0	0	64	0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
189	0	0	0	0	-1	-1.6	1	0	0	0	0	0	0	0	0	0	0	0	FF	
190	0	0	0	0	1	3	1	0	1	0	0	0	1	0	-1	0	0	0	FF	EE
191	0	0	1	0	1	1	2	0	-1	0	0	0	0	0	0	0	0	0	FF	DE
192	0	0	0	0	1	6	1	0	0	0	0	0	0	0	0	0	-1	0	FF	DE
193	-1	0	0	0	1	0.5	2	0	1	0	0	0	0	0	0	0	0	0	FF	
194	0	0	0	0	0	1	1	0	0	0	0	0	-1	0	0	0	0	0	FF	
195	0	0	0	0	1	8	2	0	0	0	0	0	0	1	0	0	0	0	FF	DE
196	0	0	0	0	-1	-4.8	1	0	0	0	0	0	-1	-1	0	0	0	0	EE	LR
197	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	FF	
198	0	0	0	0	1	0	2	0	0	0	0	0	1	1	0	0	0	0	FF	EE
199	0	0	0	0	1	3.3	1	0	-1	0	0	-1	0	0	-1	0	0	0	FF	DE
200	0	0	0	0	1	3.2	1	0	0	0	0	0	1	1	1	0	0	0	FF	
201	0	0	0	0	1	8.8	1	0	0	0	0	0	1	0	0	0	-1	0	FF	EE
202	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	FF	EE
203	0	0	0	0	1	1.4	2	0	0	0	0	0	0	0	0	0	-1	0	FF	DE
204	0	0	0	0	1	3.2	1	0	0	0	0	0	0	0	0	0	0	0	FF	
205	0	0	0	0	1	0	1	0	0	0	0	0	-2	0	0	0	-2	0	FF	
206	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
207	0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	-1	0	FF	
208	0	0	0	0	1	1.5	1	0	-2	0	0	0	0	1	0	0	0	0	FF	EE
209	0	0	0	1	1	9.600001	1	0	-1	0	0	0	0	0	0	0	-1	0	FF	
210	0	0	0	0	1	4	2	0	1	0	0	0	1	0	0	0	0	0	FF	EE
211	0	0	0	0	1	13	1	0	0	0	0	0	1	1	0	0	0	0	FF	DE
212	0	0	0	0	1	-6.4	1	0	-1	0	0	-1	1	1	0	0	0	0	FF	EE
213	0	0	0	0	1	1	1	0	-2	0	0	-1	-1	0	0	0	-2	0	FF	
214	0	0	0	0	1	6.4	1	0	1	1	0	0	1	0	0	0	-1	0	FF	EE
215	0	0	0	0	1	0	1	0	-1	0	0	-2	1	1	0	0	0	0	FF	EE
216	0	0	0	0	1	3	2	0	1	0	0	0	1	0	0	0	0	0	FF	EE
217	0	0	0	0	1	3	1	0	0	1	0	1	1	0	0	0	-1	0	FF	EE
218	0	0	1	0	1	0.6	1	1	0	0	0	0	1	0	0	0	-1	0	FF	
219	0	1	1	0	1	1	1	0	1	1	0	0	1	0	0	0	0	0	FF	DE
220	0	0	0	0	1	2.4	1	0	1	1	0	2	0	1	0	0	0	0	FF	DE
221	0	0	1	0	1	3.2	1	0	-1	0	0	0	0	0	0	0	0	0	FF	DE
222	0	0	0	0	1	1	2	0	1	0	0	0	0	0	0	0	0	0	FF	DE
223	0	0	0	0	1	2.4	1	0	0	0	0	0	1	0	0	0	0	0	FF	EE
224	0	0	1	0	1	4	1	0	0	0	0	0	1	0	0	0	0	0	FF	EE
225	0	1	1	0	1	0.8	1	0	0	0	0	0	1	0	0	0	0	0	FF	DE
226	0	0	0	0	1	3.2	1	-1	0	0	0	0	0	0	1	0	0	0	FF	EE
227	2	0	0	0	1	24	1	1	0	0	0	0	0	0	0	0	0	0	FF	
228	2	0	0	0	0	5.4	1	1	0	0	0	0	0	0	0	0	0	0	FF	EE
229	-2	-2	0	0	1	0	1	-1	0	0	0	0	0	0	0	0	0	0	FF	
230	-1	0	0	-1	0	1.8	1	0	1	1	0	2	0	2	0	0	0	0	DE	
231	-1	0	0	-1	0	-2	1	-1	0	0	0	0	-1	0	-1	0	0	0	FF	
232	0	0	0	0	1	3	1	0	0	0	0	0	1	0	0	0	0	0	FF	
233	1	0	0	0	1	2	1	1	0	0	0	0	1	2	0	0	-1	0	FF	
234	-1	0	0	-1	0	-2.7	1	-1	0	0	0	0	0	0	-1	0	-1	0	FF	
235	0	1	0	0	1	10	1	0	1	1	0	2	1	2	0	1	0	0	DE	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
189					DO	EE	LF				3	1862	8	29	530	1862	8	29	1200
190	LF				DD						1	1862	9	14	900	1862	9	14	2200
191					DO						1	1862	9	17	530	1862	9	17	1630
192					DD						3	1862	10	3	1000	1862	10	3	1330
193					DO	FF	EE				1	1862	10	8	1400	1862	10	8	1800
194					DD						1	1862	12	13	1100	1862	12	13	1600
195					DD						3	1862	12	31	700	1862	12	31	1200
196		FF			DO	EE	RR				3	1863	5	1	1115	1863	5	1	1430
197					DO	FF					1	1863	5	16	1030	1863	5	16	1600
198	RR				DO						1	1863	6	9	400	1863	6	9	1600
199					DD						4	1863	7	1	1000	1863	7	1	1700
200					DD						2	1863	9	19	530	1863	9	19	1830
201	RF	FF	PP		DD						2	1863	11	24	1000	1863	11	24	1200
202	RF				DO						2	1864	5	5	715	1864	5	5	2000
203					DO						1	1864	5	8		1864	5	18	
204					DD						1	1864	5	15	500	1864	5	15	1600
205					DD						1	1864	6	3	430	1864	6	3	1330
206					DD						1	1864	6	27	900	1864	6	27	1130
207					DD						1	1864	7	20	1500	1864	7	20	1800
208	LF				DD						1	1864	7	22	1230	1864	7	22	1930
209					DD						5	1864	6	15	1900	1864	6	15	2300
210					DD						1	1864	8	18		1864	8	21	
211					DD						1	1864	9	19	500	1864	9	19	1700
212	LF				DO	FF					3	1864	10	19	530	1864	10	19	1000
213					DD						1	1864	11	30	1530	1864	11	30	2300
214	LR				DD						2	1864	12	15	800	1864	12	15	1745
215	LF				DO	FF					2	1865	3	19	600	1865	3	19	1900
216	RF				DO	EE	LF				1	1865	3	29		1865	3	31	
217	LR				DD						1	1865	4	1	1600	1865	4	1	1930
218					DD						1	1865	4	2		1865	4	2	
219					DO	FF					1	1865	4	6	830	1865	4	6	1930
220					DD						1	1870	8	4	830	1870	8	4	1500
221					DD						1	1870	8	6	800	1870	8	6	1700
222					DD						1	1870	8	6	500	1870	8	6	1800
223	LF				DO	FF					1	1870	8	16	1000	1870	8	16	2200
224	RF				DO	FF					1	1870	8	18	1130	1870	8	18	2000
225					DO	FF					1	1870	9	1	400	1870	9	1	1700
226	RF				DD						1	1870	11	9	900	1870	11	9	1600
227					DD						1	1870	12	2		1870	12	4	
228	LF				DD						2	1871	1	11	900	1871	1	11	1700
229					dd						1	1871	1	15		1871	1	17	
230		FF			DD						1	1879	1	22	1200	1879	1	22	1600
231					DO	FF					1	1879	7	4	800	1879	7	4	900
232					DO	FF					1	1881	2	27	1230	1881	2	27	1330
233					DD						1	1882	9	13	455	1882	9	13	700
234		EE	RF		DO	FF					1	1898	9	2	630	1898	9	2	1130
235		FF			DD						1	1896	3	1		1896	3	1	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
189	R	M	0				D	S	T	T									-1
190	G	M	0				D	S	T	T									0
191	R	M	0				D	S	T	T									-1
192	R	M	0				D	S	T	T									0
193	R	M	0				D	S	T	T									-1
194	R	M	0				D	S	T	T									-1
195	R	M	0				W	L	C	T									0
196	R	M	0				D	S	T	T									-1
197	R	M	0				D	S	T	T									1
198	R	M	0				D	S	T	T									0
199	R	M	0				D	S	T	T									0
200	R	M	0				D	S	T	T									1
201	G	M	0	R	M		W	L	T	T	D	S	T	T					1
202	R	M	0	R	W		D	S	T	T									0
203	R	M	0				D	S	T	T	W	H	T	T					0
204	R	M	0				W	L	T	T									1
205	R	M	0				D	S	T	T									0
206	R	M	0	G	M		D	S	H	T									0
207	R	M	0				D	S	T	T									0
208	R	M	0				D	S	T	T									-1
209	R	M	0				D	S	T	T									-1
210	R	M	0	R	W		W	H	T	T									0
211	R	M	0				D	S	T	T									0
212	R	M	0				D	S	T	T									0
213	R	M	0	F	M		D	S	T	T									-1
214	R	M	0				D	S	T	T									1
215	R	M	0				D	S	T	T									0
216	R	M	0				W	H	T	T									0
217	R	M	0				D	S	T	T									0
218	R	M	0				D	S	T	T									0
219	R	M	0				W	L	T	T									0
220	G	M	0				W	L	T	T									0
221	G	M	0				W	L	T	T									0
222	G	W	0				W	L	T	T									0
223	R	M	0				D	S	T	T									1
224	R	M	0				D	S	T	T									1
225	R	M	0				D	S	T	T									2
226	R	M	0				W	L	C	T									0
227	R	M	0				W	H	C	T									0
228	R	M	0				W	H	C	T									0
229	R	M	0				W	H	C	T									-2
230	R	B	0	G	B		D	S	H	T									0
231	R	B	0				D	S	T	T									0
232	G	B	0				D	S	H	T									1
233	F	B	0				D	S	T	E									1
234	F	B	0				D	S	T	T	D	S	T	D					-1
235	R	M	0	G	B		D	S	T	E									1

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
189	0	0	-2	0	0	-2	-1
190	0	0	1	0	-1	0	1
191	0	0	1	0	0	-1	-1
192	0	0	0	0	0	0	-1
193	-1	0	0	0	0	-1	0
194	0	0	0	0	-1	-1	-1
195	0	0	0	0	0	0	0
196	0	0	-1	0	0	-2	-1
197	0	0	0	0	-1	2	1
198	0	0	1	0	0	0	1
199	0	0	-1	0	-1	0	-1
200	0	0	1	0	-1	1	1
201	0	0	0	0	-1	1	1
202	0	0	0	0	-2	-1	-1
203	0	0	0	0	0	-1	-1
204	0	0	0	0	0	2	1
205	0	0	0	0	0	-1	-1
206	0	0	0	0	-1	-1	-1
207	0	0	0	0	0	-1	-1
208	0	0	0	0	0	0	-1
209	0	0	-1	0	0	-1	-1
210	0	0	0	-1	-1	0	1
211	0	1	0	0	0	0	1
212	0	-1	0	0	0	-2	-1
213	0	0	0	0	-1	-1	-1
214	0	1	0	0	-1	1	1
215	0	-1	0	0	1	0	-1
216	0	1	0	-1	0	0	0
217	0	1	0	0	0	0	1
218	1	1	0	0	-1	0	1
219	0	1	0	0	0	0	1
220	0	0	1	0	0	0	1
221	0	0	0	0	0	0	1
222	0	0	0	0	0	0	1
223	0	0	0	0	0	1	1
224	0	0	0	0	-1	1	1
225	0	0	0	0	0	1	1
226	-1	0	1	0	0	0	1
227	2	0	0	0	0	0	1
228	2	0	0	0	0	0	1
229	-2	0	0	0	0	-1	-1
230	0	0	1	0	0	1	1
231	0	0	0	0	0	0	-1
232	0	0	0	0	-1	0	1
233	1	0	0	0	0	1	1
234	-1	0	0	0	0	-1	-1
235	0	0	1	0	0	1	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
236	4.00	4.80	0	PD		0	0	0	-1	0	8000	1	8000	0	468	7532	3500	1	3500
237	7.20	12.80	0	PD		0	0	0	-2	0	15000	1	15000	0	948	14052	9000	1	9000
238	9.50	10.00	0	PD		0	0	0	0	0	13411	1	13411	0	1126	12285	5500	1	5500
239	3.50	8.20	0	PD		0	0	0	1	0	24000	1	24000	0	1734	22266	5000	1	5000
240	4.00	4.00	0	PD		0	0	0	0	0	15000	1	15000	0	1270	13730	4000	1	4000
241	3.20	1.60	0	PD		0	0	0	0	0	15065	1	15065	0	1572	13493	1592	1	1592
242	8.00	14.00	0	PD		0	0	0	0	0	56000	1	56000	0	1110	54900	18000	1	18000
243	6.00	6.50	2	HD	PD	0	0	0	0	0	36000	1	36000	0	1200	34800	38000	3	
244	42.00	42.00	1	PD	FD	0	1	1	0	0	135000	3			17500	117500	150000	3	
245	64.00	64.00	1	HD	PD	0	1	0	0	0	210000	3			46000	164000	145000	3	
246	24.00	24.00	0	PD		0	0	0	0	0	58000	1	58000	0	13000	45000	40000	1	40000
247	64.00	75.00	1	PD	FD	1	0	0	0	0	314000	3			41000	273000	310000	3	
248	30.00	30.00	0	HD		0	0	0	0	0	103000	3	61800	41200	5000	98000	110000	1	110000
249	32.00	40.00	1	HD	PD	1	0	0	0	0	140000	3	65000	75000	20000	120000	110000	1	110000
250	22.00	10.00	2	PD	FD	0	0	0	0	0	50000	3	25000	25000	3000	47000	20000	1	20000
251	37.00	20.00	1	HD	PD	1	0	0	0	0	120000	1	120000	0	5000	115000	90000	1	90000
252	80.00	32.00	0	FD		0	0	0	2	0	152000	1	152000	0	9300	142700	75000	1	75000
253	335.00	335.00	0	HD		0	0	0	3	0	160000	3			50000	110000	200000	3	
254	320.00	320.00	2	HD	PD	0	0	0	0	0	80000	3			20000	60000	108500	3	
255	11.00	11.00	0	PD		0	0	0	2	-1	52000	1	52000	0	6460	45540	100000	1	100000
256	3.00	3.00	0	PD		0	0	0	1	0	1410	3			178	1232	1460	3	
257	3.00	3.00	2	HD	PD	0	0	0	0	1	4000	3			400	3600	3010	3	
258	6.00	6.00	0	PD		0	0	0	0	1	20000	3			4000	16000	8000	3	
259	3.00	5.00	0	HD		0	0	0	0	1	1300	3			278	1022	1228	3	
260	50.00	60.00	0	PD		0	0	0	2	1	57000	1	57000	0	10000	47000	30000	1	30000
261	32.00	32.00	0	HD		0	0	0	2	-1	9000	3	4000	5000	2670	6330	29954	3	11954
262	225.00	225.00	1	DL	FD	0	0	1	0	0	457000	3			65340	391660	345000	3	
263	225.00	225.00	1	HD	FD	0	0	1	0	0	350000	3			11000	339000	400000	3	
264	100.00	100.00	0	HD		0	0	0	0	0	360000	3			17196	342804	400000	3	
265	53.00	53.00	0	HD		0	0	0	0	0	440000	3			21018	418982	254000	3	
266	35.00	35.00	0	HD		0	0	0	0	0	260000	3			6210	253790	70000	3	
267	23.00	23.00	1	HD	WD	0	0	1	0	0	250000	3			8970	241030	40000	3	
268	50.00	50.00	0	HD		0	0	0	0	0	260000	3			12000	248000	200000	3	
269	144.00	144.00	0	FD		0	0	0	0	0	350000	3			75000	275000	276000	3	
270	18.00	18.00	0	HD		0	0	0	-1	0	100000	1	100000	0	5600	94400	45000	1	45000
271	32.00	32.00	0	HD		0	0	0	0	0	198000	3			40000	158000	157000	3	
272	37.00	27.80	0	HD		0	0	0	0	0	227000	3			45000	182000	82000	3	
273	30.40	30.40	0	DL		0	0	0	0	0	90000	3			2500	87500	13000	3	
274	42.00	42.00	0	HD		0	0	0	0	0	101000	3			25000	76000	141000	3	
275	64.00	64.00	0	HD		0	0	0	0	0	113000	3			26000	87000	170000	3	
276	64.00	64.00	0	HD		0	0	0	0	0	142000	3			29000	113000	180000	3	
277	112.00	112.00	2	HD	PD	0	0	0	0	0	343000	3			50000	293000	290000	3	
278	32.00	32.00	0	HD		0	0	0	-1	0	50000	1	50000	0	3500	46500	40000	3	
279	64.00	64.00	0	HD		0	0	0	0	0	120000	1	120000	0	20000	100000	150000	1	150000
280	120.00	120.00	0	HD		0	0	0	2	0	187000	3			13212	173788	160000	3	
281	121.00	121.00	0	PD		0	0	0	0	0	288600	1	288600	0	40000	248600	273000	1	273000
282	64.00	64.00	0	HD		0	0	0	0	0	350000	3			50000	300000	260000	3	

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
236	0	150	3350	0	0	0	0	16	0	0	0	0	0	0	0	0	9	0	0	0	0
237	0	236	8764		0	0	0	29	0	0		0		0	0	0		0	0		0
238	0	50	5450	836	0	0	0	44	0	0	10	0	500	0	0	0		0	0		0
239	0	335	4665		0	0	0	40	0	0	0	0		0	0	0	10	0	0	0	0
240	0	350	3650		0	0	0	32	0	0	0	0		0	0	0	6	0	0	0	0
241	0	850	742		0	0	0	38	0	0	0	0		0	0	0	4	0	0	2	0
242	0	2500	15500	1800	0	0	0	132	0	0	0	0	2000	0	0	0	48	0	0	21	0
243		3800	34200	2000	0	0	0	108	0	0	0	0	3000	0	0	0	94	0	0	16	0
244		16500	133500	5000	0	0	0	552	0	0	0	0	15000	0	0	0	542	0	0		0
245		17000	128000	18000	0	0	0	928	0	0	45	0	7000	0	0	0	612	0	0	14	0
246	0	9400	30600		0	0	0	350	0	0		0		0	0	0		0	0		0
247		96500	213500	9000	0	0	0	892	0	0	0	0	15000	0	0	0	1192	0	0	58	0
248	0	10000	100000	0	0	0	0	180	0	0		0	0	0	0	0		0	0	120	0
249	0	30000	80000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
250	0	6000	14000	0	0	0	0	72	0	0		0	0	0	0	0		0	0	60	0
251	0	20000	70000	0	0	0	0		0	0	0	0	0	0	0	0	80	0	0	70	0
252	0	15000	60000	0	0	0	0	444	0	0		0	0	0	0	0	250	0	0	250	0
253		150000	50000	0	1	1	0	179		0			0				598			231	
254		50000	58500	0				220					0				571			160	
255	0	6660	93340	0	50			230	200	15	10	17	0	70				240	21	0	22
256		350	1110	0	0	0	0	14	0	0	0	0	0	20			20	0	17		0
257		41	2969	0	30			40	103	15		0	0	0	0	0	22	0	0	0	0
258		1100	6900	0	200			100	407	50		6	0	0	0	0	37	0	0		0
259		250	978	0	10	10	0	4	40	10	0	0	0	0	0	0	14		0		
260	0	11500	18500	0	498			216					0	120			135				51
261	18000	19600	10354	0	0	0	0	8		0	0		0	55			96		44	96	
262		32880	312120	0	0	0	0		0	0		0	0	0	0	0		0	0		0
263		21780	378220	0	0	0	0		0	0		0	0	0	0	0		0	0		0
264		12720	387280	0	0	0	0		0	0		0	0	0	0	0		0	0		0
265		8000	246000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
266		1638	68362	0	0	0	0	600	0	0		0	0	0	0	0	328	0	0	2	0
267		7800	32200	0	0	0	0		0	0		0	0	0	0	0	150	0	0	38	0
268		8000	192000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
269		52000	224000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
270	0	2500	42500	0	0	0	0		0	0		0	0	0	0	0	72	0	0		0
271		39000	116000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
272		19000	63000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
273		3500	9500	0	0	0	0	380	0	0		0	0	0	0	0	24	0	0		0
274		29000	112000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
275		27000	143000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
276		29000	151000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
277		30000	260000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
278		2000	38000	0	0	0	0	120	0	0		0	0	0	0	0	100	0	0		0
279	0	20000	130000	0	0	0	0	300	0	0		0	0	0	0	0	450	0	0		0
280		120000	40000	0	0	0	0	818	0	0		0	0	0	0	0	600	0	0	500	0
281	0	125000	148000	0	0	0	0		0	0		0	0	0	0	0	800	0	0	150	0
232		50000	210000	0	0	0	0	875	0	0	40	0	0	0	0	0	690	0	0	28	0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
236	0	0	0	0	0	1.5	1	1	0	0	0	1	0	0	0	0	-1	0	FF	
237	0	0	0	0	0	0	1	1	0	0	0	0	-2	-2	0	0	-1	0	FF	
238	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	-1	0	FF	
239	0	0	0	0	-1	0	1	1	1	0	0	0	-1	0	0	0	-1	0	FF	
240	0	1	1	0	1	0.5	2	0	0	-1	0	1	0	0	0	1	-1	0	FF	DE
241	0	0	0	0	1	1.6	1	0	0	0	0	0	-1	0	0	0	-1	0	FF	
242	0	0	0	0	1	6.4	1	0	1	0	0	1	1	0	0	0	-1	0	EE	LF
243	0	0	0	0	1	9.600001	1	0	0	-1	0	0	0	0	0	0	-1	0	FF	
244	0	0	0	0	1	25	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
245	0	0	0	0	0	-23.8	1	0	0	0	0	0	0	0	0	0	0	0	FF	
246	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
247	0	0	0	0	1	48.6	1	0	0	0	0	0	0	0	0	0	0	0	FF	
248	1	0	0	0	1		1	1	1	0	0	0	0	0	1	0	0	0	FF	
249	1	0	1	0	1		1	1	0	0	0	0	1	0	0	1	-1	0	FF	EE
250	1	0	1	0	1		1	1	1	0	0	0	0	0	1	0	-1	0	FF	
251	1	0	1	0	1	6	1	1	1	0	0	0	0	0	0	0	0	0	EE	LF
252	1	0	1	0	1	9.899999	1	1	0	0	0	0	1	1	1	0	-1	0	FF	
253	1	0	0	0	1	360	1	1	0	1	0	0	2	2	0	0	0	0	EE	LF
254	1	0	1	0	1	120	1	1	0	1	0	0	2	0	0	0	0	0	EE	RR
255	0	-1	0	0	0	-2	1	0	-1	0	-1	-1	0	1	-1	-1	-1	-1	FF	
256	1	0	0	0	1	0.5	1	0	-1	0	0	0	0	1	1	0	-1	1	EE	LF
257	-1	0	0	0	0	0	2	0	-1	1	1	0	0	0	0	0	-1	0	DE	
258	-1	0	0	0	0	1	2	0	-1	1	1	0	0	0	1	0	-1	0	FF	EE
259	0	0	0	0	1	7.4	2	0	-1	1	1	0	0	0	0	0	0	0	FF	DE
260	0	1	0	0	1	21.6	1	0	1	1	1	0	1	1	1	1	-1	0	FF	EE
261	1	1	0	0	1	0	1	1	1	1	-1	-1	1	1	1	1	0	0	FF	DE
262	0	0	0	0	0	35	2	0	0	0	0	0	-1	0	0	0	-1	-1	FF	
263	0	0	0	0	0	56	1	0	0	0	0	0	1	0	0	0	0	0	FF	
264	0	0	0	0	0	-28	1	0	0	0	0	0	1	0	0	0	0	0	FF	
265	0	0	0	0	0	12	1	0	0	0	0	0	1	0	0	0	0	0	FF	
266	0	0	0	0	0	5	1	0	0	0	0	1	1	0	0	0	0	0	FF	
267	0	0	1	0	0	3	1	0	0	0	0	1	0	0	0	0	0	0	FF	DE
268	0	0	1	0	0	4	2	0	-1	0	0	0	0	0	-1	0	0	0	FF	EE
269	0	0	0	0	0	13.5	1	0	0	0	0	0	0	0	0	0	-1	-1	FF	
270	0	0	0	0	-1	1	2	0	1	0	0	0	0	-1	0	0	0	0	FF	
271	0	0	0	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	FF	
272	0	0	0	0	1	28	1	0	0	0	0	0	0	0	1	0	0	0	FF	EE
273	0	0	0	0	0	40	1	0	0	0	0	1	0	0	0	0	0	0	FF	
274	0	0	0	0	0	12.8	1	0	0	0	0	0	0	0	0	0	0	0	FF	DE
275	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	FF	DE
276	0	0	0	0	-1	0	1	0	-1	0	0	0	0	0	0	0	0	0	FF	EE
277	0	0	1	0	0	7.8	2	0	0	0	0	0	0	0	0	0	0	0	FF	
278	-1	0	0	0	-1	-11.2	1	-1	0	0	0	0	0	0	0	0	0	0	FF	
279	1	0	0	0	0	8	2	1	0	0	0	0	0	0	0	0	0	0	FF	EE
280	1	1	0	0	1	12	1	1	0	1	0	0	2	1	0	0	0	0	FF	DE
281	1	0	0	0	1	85	1	2	0	0	0	0	1	0	0	0	0	0	FF	EE
282	0	0	0	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	FF	EE

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
236					DD						1	1899	11	28	530	1899	11	28	1530
237					DD						1	1899	12	11	500	1899	12	11	1400
238					DD						1	1899	12	15	630	1899	12	15	1700
239		EE	LF		DD						1	1900	1	24	800	1900	1	24	1900
240					DD						3	1900	2	18	800	1900	2	18	1200
241					DD						1	1898	7	1	630	1898	7	1	1700
242	RC				DD						2	1904	4	30	400	1904	4	30	2000
243		EE	RF		DD						2	1904	6	14	1200	1904	6	14	1900
244		DE			DO						1	1904	8	25		1904	9	3	
245					DO						1	1904	10	5		1904	10	18	
246		EE	LF		DO						2	1905	1	26	1030	1905	1	26	1815
247		EE	RF		DD						1	1905	2	21		1905	3	10	
248					DO						2	1912	10	23	530	1912	10	23	2130
249	LF				DD						1	1912	10	28		1912	11	1	
250		DE			DO	FF					1	1912	11	1		1912	11	2	
251	FF				DO	FF					1	1912	11	5		1912	11	5	
252		FE			DD						1	1913	3	23		1913	3	25	
253	FF				DD						1	1920	8	14		1920	8	25	
254		FF			DO	FF					1	1920	9	23		1920	9	28	
255		EE	LF		DO	FF		EE	LF		1	1937	3	11		1937	3	15	
256	FF	FF			DO						1	1938	7	31	200	1938	7	31	800
257					DD						4	1938	8	2	800	1938	8	2	1600
258	RF	EE	LF		DO						1	1938	8	6		1938	8	10	
259					DO						1	1939	5	28		1939	5	29	
260	RF	EE	LF		DO						1	1939	8	20		1939	8	31	
261		FF	DE		DO						1	1939	12	11		1940	1	8	
262					DD						1	1914	8	15		1914	8	19	
263					DD						1	1914	8	20		1914	8	21	
264					DD						1	1914	8	22		1914	8	23	
265		EE	RF		DO	FF					1	1914	8	22		1914	8	23	
266		EE	LF		DD						1	1914	8	23	900	1914	8	23	2300
267					DD						1	1914	8	26	600	1914	8	26	1800
268	LF				DO	FF					1	1914	8	29	900	1914	8	29	2300
269		FE			DO	FF					1	1914	9	3		1914	9	7	
270		EE	RF		DO	FF					1	1914	9	5		1914	9	5	
271		EE	RF		DO	FF		EE	LF		1	1914	9	6		1914	9	9	
272	RF				DD						1	1914	9	6		1914	9	9	
273		EE	LF		DD						1	1914	9	6		1914	9	9	
274					DO	FF					1	1914	9	6		1914	9	9	
275					DO	FF					1	1914	9	6		1914	9	9	
276	LF				DD						1	1914	9	6		1914	9	9	
277					DO	FF					1	1914	9	13		1914	9	18	
278					DO	EE	LF				1	1914	8	17	1100	1914	8	17	2000
279	RF				DO	FF					1	1914	8	20	400	1914	8	20	1600
280					DO	FF					1	1914	8	26		1914	8	29	
281	LF				DD						1	1914	9	9		1914	9	13	
282	RF				DD						1	1914	8	23		1914	8	25	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
236	F	M	0				D	S	H	T									-1
237	F	B	0				W	H	T	T	D	S	H	T					-1
238	F	B	0	R	B		D	S	H	T									-1
239	R	B	0				D	S	H	T									0
240	F	M	0				D	S	H	T									1
241	G	M	0				D	S	H	T									0
242	G	M	0				D	S	T	T									2
243	R	M	0				D	S	T	T									2
244	G	M	0				D	S	T	T									1
245	R	M	0				D	S	T	T									1
246	F	M	0				W	L	C	T									-1
247	F	M	0				D	S	T	T									1
248	G	M	0				W	H	T	T									1
249	R	M	0				D	S	T	T									0
250	G	M	0				W	H	T	T									1
251	G	M	0	R	M		W	H	T	T									1
252	G	M	0				W	H	T	T									1
253	F	B	0	F	M		D	S	T	T	W	L	T	T					1
254	F	M	0				D	S	T	T	W	L	T	T					1
255	F	B	0	R	B		W	L	C	T	W	H	C	T					0
256	G	B	0	R	B		D	O	T	T	W	L	T	T					2
257	G	B	0	R	B		D	S	H	T	D	O	T	T					-1
258	G	B	0	R	B		D	S	T	T									-1
259	R	B	0				D	S	T	T									0
260	R	B	0				D	S	H	T	D	S	T	T					0
261	R	M	0	R	W		W	H	C	T									1
262	R	M	0				D	S	T	T									0
263	R	M	0				D	S	T	T									0
264	R	W	0				W	O	T	T	D	S	T	T					0
265	R	M	0				D	S	T	T									0
266	F	M	0				D	S	T	T									0
267	R	M	0				D	S	T	T									0
268	R	M	0				D	S	T	T									0
269	R	M	0	G	W		D	S	T	T									0
270	R	M	0				D	S	T	T									-1
271	R	M	0				D	S	T	T									0
272	R	M	0				D	S	T	T									1
273	R	M	0				D	S	T	T									0
274	F	M	0	R	M		D	S	T	T									-1
275	R	M	0				D	S	T	T	W	L	T	T					0
276	R	M	0	R	W		D	S	T	T	W	L	T	T					0
277	R	M	0				W	L	T	T									0
278	F	M	0	R	M		D	S	T	T									-1
279	F	M	0	R	M		D	S	T	T									0
280	F	W	0	R	W	O	D	S	T	T	W	L	T	T					2
281	F	W	0	R	W		D	S	T	T	W	L	T	T					1
282	R	M	0				D	S	T	T									0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
236	1	1	0	0	-2	-1	1
237	1	0	-1	0	-1	-1	-1
238	1	0	-1	-1	-2	-2	-1
239	1	0	-1	-1	-1	-1	-1
240	1	1	0	0	-1	1	0
241	0	0	-1	0	-1	0	1
242	0	0	0	0	-1	2	1
243	0	0	1	1	0	2	1
244	0	0	0	0	-1	1	1
245	0	0	0	0	0	-1	-1
246	0	0	0	0	0	-1	-1
247	0	0	0	0	0	1	1
248	0	1	0	0	0	1	1
249	0	0	0	0	0	0	1
250	0	1	0	0	0	1	1
251	0	0	0	0	-1	1	1
252	0	1	1	0	0	1	1
253	0	0	1	0	0	2	1
254	0	0	0	0	0	2	1
255	-1	0	0	-1	-1	0	-1
256	0	0	0	0	-1	1	1
257	0	0	0	0	-1	-1	-1
258	0	0	0	0	-1	-1	-1
259	0	0	0	0	0	0	0
260	0	0	1	0	0	0	1
261	1	0	1	1	1	1	1
262	0	0	0	0	0	0	-1
263	0	0	0	0	0	0	1
264	0	0	0	0	0	0	-1
265	0	0	0	0	0	0	1
266	0	0	0	0	0	0	1
267	0	0	0	0	0	1	1
268	0	0	-1	0	0	0	0
269	0	0	0	0	-1	0	-1
270	0	0	0	0	0	-1	0
271	0	0	0	0	0	0	0
272	0	0	0	0	0	1	1
273	0	0	0	0	0	1	1
274	0	0	0	0	-1	-1	-1
275	0	0	0	0	0	0	-1
276	0	0	0	0	-1	-1	-1
277	0	0	-1	0	0	0	-1
278	-1	0	-1	0	0	-1	-1
279	1	0	1	0	0	0	0
280	1	0	1	0	0	2	1
281	1	1	1	0	0	1	1
282	0	0	0	0	0	0	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
283	72.00	72.00	0	HD		0	0	0	0	0	300000	3			40000	260000	260000	3	
284	150.00	150.00	0	HD		0	0	0	0	0	240000	3			76000	164000	480000	3	
285	160.00	160.00	0	HD		0	0	0	0	0	900000	3			180000	720000	936000	3	
286	120.00	120.00	0	HD		0	0	0	0	0	260000	3			60000	200000	400000	3	
287	74.00	74.00	0	HD		0	0	0	0	0	200000	3			34000	166000	200000	3	
288	106.00	106.00	0	PD		0	0	0	2	0	200000	3			45000	155000	300000	3	
289	17.00	17.00	0	FD		0	0	0	0	0	163182	1	163182		42820		85220	1	85220
290	3.60	3.60	0	FD		0	0	0	1	1	87000	3			12892	74108	40000	3	20000
291	23.00	23.00	0	FD		0	0	0	2	0	150000	3			35000	115000	190000	3	
292	6.00	6.00	0	FD		0	0	0	0	0	90365	3			16648	73717	30000	3	
293	7.20	7.20	0	FD		0	0	0	0	0	298437	3			61713	236724	75000	3	
294	209.00	209.00	0	PD		0	0	0	2	0	650000	3			135000	515000	300000	3	
295	121.00	121.00	0	PD		0	0	0	2	0	216000	1	216000	0	36000	180000	219000	1	219000
296	16.00	16.00	0	FD		0	0	0	0	0	200000	3			14947	185053	100000	3	
297	29.00	29.00	0	FD		0	0	0	0	0	200000	3			41866	158134	128500	3	
298	29.00	29.00	0	FD		0	0	0	0	0	356000	3			67008	288992	157000	3	
299	29.00	29.00	0	FD		0	0	0	0	0	311000	3			48967	262033	136000	3	
300	11.20	11.20	0	PD		0	0	0	0	0	32000	3			5400	26600	10000	3	
301	4.80	4.80	0	HD		0	0	0	1	0	25000	1	25000	0	9000	16000	15800	3	1800
302	16.00	16.00	0	FD		0	0	0	1	0	11000	1	11000	0	1230	9770	11300	1	11300
303	12.10	16.00	1	FD	PD	1	1	0	0	1	13756	1	13756	0	4593	9163	20400	3	
304	62.40	62.40	0	FD		0	0	0	0	1	600000	1	600000		670000		300000	1	300000
305	19.20	19.20	0	FD		0	0	0	0	1	290000	1	290000	0	57450	232550	95000	1	95000
306	1.40	1.40	0	FD		0	0	0	0	1	11300	1	11300	0	5121	6179	2800	1	2800
307	4.50	4.50	0	FD		0	0	0	2	1	45000	1	45000	0	9000	36000	15000	1	15000
308	9.60	9.60	0	FD		0	0	0	3	1	190000	1	190000	0	3500	186500	90000	1	90000
309	110.00	110.00	0	FD		0	0	0	3	0	103000	3			8000	95000	61000	3	
310	20.00	20.00	0	PD		0	0	0	0	0	350000	3			100000	250000	180000	3	
311	400.00	400.00	0	PD		0	0	0	2	0	600000	1	600000		495000		500000	1	500000
312	48.00	48.00	0	FD		0	0	0	0	0	300000	3			3800	296200	160000	3	
313	48.00	48.00	1	HD	PD	0	1	0	0	0	213000	1	213000		41264		118000	1	118000
314	48.00	48.00	0	HD		0	0	0	0	0	200000	1	200000		72000		172000	1	172000
315	22.50	22.50	0	FD		0	0	0	1	0	308000	1	308000		51232		168000	1	168000
316	32.00	32.00	0	FD		0	0	0	1	1	276000	1	276000		83379		120000	1	120000
317	64.00	64.00	0	FD		0	0	0	0	0	1000000	3			118000	882000	480000	3	
318	19.00	19.00	0	FD		0	0	0	1	1	180000	1	180000		17000		100000	1	100000
319	48.00	48.00	0	FD		0	0	0	0	1	380000	1	380000		399821		200000	1	200000
320	16.00	16.00	0	FD		0	0	0	2	0	90000	1	90000		15000		75000	1	75000
321	22.00	22.00	0	PD		0	0	0	1	0	130000	1	130000		28000		90000	1	90000
322	25.00	25.00	0	FD		0	0	0	0	0	280000	1	280000		157000		165000	1	165000
323	30.00	30.00	0	FD		0	0	0	0	0	518000	1	518000		166000		252000	1	252000
324	160.00	160.00	0	FD		0	0	0	1	0	602000	3			20000	582000	574000	3	
325	7.20	40.00	0	PD		0	0	0	0	1	46000	3			2750	43250	10500	3	
326	12.00	19.20	0	PD		0	0	0	0	1	25000	1	25000	0	4000	21000	26000	1	26000
327	24.00	24.00	0	FD		0	0	0	0	1	25000	1	25000	0	6400	18600	20000	1	20000
328	32.00	48.00	0	FD		0	0	0	2	1	72000	3			2696	69304	34000	3	
329	24.00	24.00	0	PD		0	0	0	0	1	85000	1	85000	0	4000	81000	15500	1	15500

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
283		90000	170000	0	0	0	0	750	0	0	30	0	0	0	0	0	720	0	0	100	0
284		35000	445000	0	0	0	0	828	0	0	75	0	0	0	0	0	1304	0	0	30	0
285		82000	854000	0	0	0	0	2000	0	0	160	0	0	0	0	0	2000	0	0	30	0
286		95000	305000	0	0	0	0		0	0		0	0	0	0	0		0	0		0
287		18000	182000	0	0	0	0		0	0	70	0	0	0	0	0		0	0		0
288		92000	208000	0	0	0	0		0	0		0	0	0	0	0		0	0	133	0
289		23050		0	0	0	0	879		0			0	0	0	0	470		0		
290	20000	12000	28000	0	0	0	0	530		0			0	0	0	0			0		
291		70000	120000	0	0	0	0			0			0	0	0	0			0		
292		5000	25000	0	0	0	0	433		0			0	0	0	0			0		
293		19836	55164	0	0	0	0			0			0	0	0	0			0		
294		210000	90000	0	0	0	0			0			0	0	0	0	212		0	186	
295	0	153654	65346	0	0	0	0	622		0			0	0	0	0			0		
296		9958	90042	0	0	0	0	212		0			0	0	0	0			0		
297		46640	81860	0	0	0	0			0			0	0	0	0			0		
298		31474	125526	0	0	0	0	1200		0			0	0	0	0			0		
299		40217	95783	0	0	0	0	1200		0			0	0	0	0			0		
300		3900	6100	0	0	0	0	345	0	0		0	0	0	0	0		0	0		0
301	14000	750	15050	0	0	0	0	56	0	0		0	0	0	0	0	20	0	0		0
302	0	5300	6000	0	0	0	0	28		0	0		0	0	0	0	38		0		
303		6188	14212	0	0	0	0	30		0	0	2	0	0	0	0	52	0	0	0	0
304		500000		0	49	0	49	1537		33			0	0	0	0	400		0		
305	0	8000	87000	0	0	0	0	1537		0			0	0	0	0			0	20	
306	0	281	2519	0	0	0	0			0			0	0	0	0			0		
307		4000		0	0	0	0			0			0	0	0	0			0		
308	0	3000	87000	0	36	0	36			25			0	0	0	0	800		0		
309		25000	36000	0	0	0	0	239		0			0	0	0	0	100		0	12	
310		20000	160000	0	0	0	0	887		0			0	0	0	0	440		0		
311		260000		0	0	0	0	1938	0	0		0	0	0	0	0	1846	0	0	330	0
312		1985	158015	0	0	0	0			0			0	0	0	0			0		
313		74887		0	0	0	0	2000		0			0	0	0	0	623		0		
314		29000		0	0	0	0	623		0			0	0	0	0	2000		0		
315		41835		0	0	0	0	686		0			0	0	0	0	147		0		
316		75000		0	48			2817					0	0	0	0	1014		0	150	
317		40000	440000	0	150			5114					0	0	0	0			0	227	
318		32500		0				2266					0	0	0	0	1000		0	67	
319		270710		0				2174					0	0	0	0	1040		0		
320		25000		0	324	0	324	1000		108			0	0	0	0	900		0	138	
321		29000		0	0	0	0	1200		0			0				1000			120	
322		75700		0	0	0	0	2200		0			0	0	0	0	1400		0		
323		85000		0	0	0	0	1700		0			0	0	0	0			0		
324		305000	269000	0	0	0	0	4000		0			0	0	0	0	3600		0	3152	22
325		4300	6200	0	0	0	0	174		0			0	0	0	0	91		0	39	
326	0	2450	23550	0	0	0	0		0	0		0	0	0	0	0		0	0		0
327	0	2000	18000	0					0			0	0					0			0
328		2950	31450	0				392					0				260				
329	0	4800	10700	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0		0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
283	0	0	0	0	0	10	1	0	0	0	0	0	0	0	0	0	0	0	FF	DE
284	0	0	0	0	0	-65	1	0	0	0	0	-1	0	0	0	0	0	0	FF	
285	0	0	0	0	0	8	1	0	-1	0	0	0	0	0	0	0	0	0	FF	
286	1	0	0	0	0	169	2	1	-1	1	0	0	1	1	1	0	0	0	FF	DE
287	0	-1	0	0	-1	-24	1	0	-1	0	0	0	0	0	0	0	0	0	FF	
288	0	1	0	0	1	98	1	0	0	0	0	0	0	1	0	1	0	0	FF	
289	0	0	0	0	0	3	2	0	-1	0	0	0	0	0	0	0	-1	-1	FF	
290	0	0	0	0	0	1.6	2	0	-1	0	1	-1	1	1	0	0	-1	-1	FF	
291	0	0	0	1	0	6.6	2	0	-1	0	0	0	-1	1	0	0	-1	-1	FF	
292	0	-1	0	0	0	1.1	2	0	-1	0	0	0	0	0	0	0	-1	-1	FF	
293	0	0	0	0	0	6	2	0	-1	0	0	1	0	0	0	0	-1	-1	FF	
294	1	1	0	1	1	150	1	1	0	0	0	0	1	1	0	0	-1	0	DE	
295	2	1	1	0	1	30	1	1	2	0	0	0	1	1	1	0	-1	0	FF	
296	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	FF	RC
297	0	0	0	0	0	0	1	0	0	0	0	0	-1	0	0	0	-1	0	FF	RC
298	0	0	0	0	0	0	1	0	0	0	0	0	-1	0	0	0	-1	0	FF	RC
299	0	0	0	0	0	0	1	0	0	0	0	0	-1	0	0	0	-1	0	FF	RC
300	0	0	0	0	0	2.5	2	0	0	0	0	0	-1	0	1	0	-1	0	FF	
301	0	0	0	0	-1	4	2	0	-2	0	0	0	0	1	1	0	0	0	FF	
302	1	-1	0	0	1	20	1	1	0	0	0	0	0	0	0	0	0	0	EE	LR
303	1	-1	0	0	0	1.5	1	1	-1	0	0	0	0	0	0	-1	-1	0	EE	LF
304	0	0	0	1	0	12	1	0	-1	0	1	0	0	0	0	0	-1	-1	FF	
305	0	0	1	0	1	1.6	1	0	0	0	0	0	0	-1	0	0	-2	-2	FF	
306	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	-1	-1	FF	
307	0	0	1	0	1	1.4	2	0	0	0	0	1	1	1	1	0	-1	-1	FF	
308	1	0	1	1	1	2	2	0	0	1	0	0	1	1	0	0	-1	-1	FF	
309	0	1	0	0	1	77	1	1	0	0	0	0	1	2	0	1	-1	0	FF	DE
310	-1	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	0	-1	-1	FF	
311	0	1	0	0	1	61.2	1	0	1	0	0	0	1	1	0	0	-1	0	FF	
312	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	-2	-1	FF	
313	0	0	0	0	1	18.9	1	0	-1	0	0	0	0	0	0	0	-1	0	FF	
314	0	1	0	0	0	12	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
315	0	1	0	0	1	6	1	0	1	0	0	0	1	1	1	0	-1	0	FF	
316	0	0	0	0	1	7.5	2	0	-1	0	0	0	1	1	1	0	-1	-1	FF	
317	0	0	0	1	0	4.5	1	0	-1	0	0	0	0	0	0	0	-1	-1	FF	
318	0	0	0	0	1	4.8	1	0	-1	0	0	0	1	1	1	0	-1	-1	FF	
319	0	0	0	0	1	78	2	0	-1	0	0	0	0	0	0	0	-1	-1	FF	
320	0	0	0	1	1	8.399999	1	0	-1	1	0	0	1	1	1	0	-1	-1	FF	
321	0	0	0	0	1	6.8	1	1	0	0	0	0	1	0	0	0	-1	-1	FF	DE
322	0	0	0	0	1	2.5	2	0	0	0	0	0	0	0	1	0	-1	-1	FF	
323	0	0	0	0	0	8.7	2	0	1	0	0	0	0	0	0	0	-1	-1	FF	
324	2	0	0	0	1	130.2	1	1	0	0	0	0	1	1	1	0	-1	0	FF	
325	1	0	1	0	0	8.100001	1	1	1	1	1	1	1	0	1	0	-1	0	FF	
326	0	0	1	0	1	0	1	0	0	0	1	-1	-1	0	0	0	-1	0	FF	
327	0	0	0	0	0	0	1	0	0	0	1	-1	-1	0	0	0	-2	0	FF	
328	1	0	0	0	1	12	1	0	0	1	1	0	1	2	2	0	-1	0	FF	EE
329	1	0	1	0	1	40	1	1	1	0	1	1	1	0	0	0	-1	0	FF	EE

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
283					DO	FF					1	1914	8	26		1914	8	30	
284					DO	FF					1	1914	8	26		1914	8	30	
285					DO	FF					1	1914	9	3		1914	9	10	
286					DO	FF					1	1914	11	12		1914	11	24	
287		EE	RF		DO	FF		EE	RF		1	1914	8	12		1914	8	19	
288					DD						1	1914	12	3		1914	12	9	
289					DD						1	1915	2	15		1915	3	16	
290					DD						6	1915	3	10	830	1915	3	10	1300
291					DD						1	1915	4	22		1915	5	24	
292					DO	FF					1	1915	5	16		1915	5	26	
293					DO	FF					1	1915	9	25		1915	10	14	
294		FE			DD						1	1915	2	7		1915	2	21	
295					DD						1	1915	5	2		1915	5	4	
296					DD						1	1915	6	23		1915	7	7	
297					DD						1	1915	7	18		1915	8	3	
298					DD						1	1915	10	18		1915	11	4	
299					DD						1	1915	11	10		1915	12	2	
300		FF	FE		DO	FF					2	1915	4	25	430	1915	4	25	1900
301					DO	FF					1	1915	6	7		1915	8	10	
302	FF	FF	FE		DD						1	1915	9	27		1915	9	28	
303		FF			DO	FF					1	1915	11	22		1915	11	24	
304					DO	FF					1	1916	7	1		1916	9	30	
305					DO	FF					1	1916	7	1	730	1916	7	1	2030
306					DO	FF					1	1916	7	1	730	1916	7	1	1930
307					DO	FF					1	1916	7	14	330	1916	7	14	2000
308					DD						1	1916	9	15	620	1916	9	15	2125
309					DD						1	1916	1	10		1916	1	16	
310					DD						1	1916	3	18		1916	3	26	
311					DD						1	1916	6	4		1916	7	7	
312					DD						1	1916	3	11		1916	3	15	
313					DD						1	1916	5	15		1916	6	10	
314					DD						1	1916	6	16		1916	7	9	
315					DD						1	1916	8	6		1916	8	17	
316					DO	FF					1	1917	4	9		1917	4	23	
317					DD						1	1917	4	16		1917	4	30	
318					DD						1	1917	6	7		1917	6	14	
319					DD						1	1917	7	31		1917	12	7	
320					DO	FF					1	1917	11	20		1917	11	26	
321					DD						1	1917	11	30		1917	12	3	
322					DO	FF					1	1917	5	12		1917	6	5	
323					DD						1	1917	8	18		1917	9	15	
324					DD						1	1917	10	24		1917	11	23	
325					DD						3	1917	2	22	1000	1917	2	22	1930
326		FE			DD						3	1917	3	26	1145	1917	3	26	1830
327					DD						2	1917	4	17	415	1917	4	17	700
328	LR	FE			DD						1	1917	10	31		1917	11	6	
329	RF				DD						1	1917	11	13		1917	11	14	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
283	R	M	0				D	S	T	T									0
284	R	M	0				D	S	T	T									0
285	R	M	0				D	S	T	T									0
286	R	M	0				W	L	C	T									1
287	G	M	0	R	M		D	S	T	T	W	L	T	T					-1
288	G	M	0	R	M		W	H	T	T									1
289	F	M	0				D	S	T	T	W	L	C	T					0
290	F	M	0				D	O	T	T									0
291	F	M	0				D	S	T	T	W	L	T	T					0
292	F	M	0				W	L	T	T									0
293	F	M	0				D	S	T	T	W	L	T	T					0
294	R	M	0				W	H	C	T									0
295	R	M	0				D	S	T	T									1
296	G	M	0				D	S	T	T	W	L	T	T					0
297	G	M	0				D	S	T	T	W	L	T	T					0
298	G	M	0				D	S	C	T	W	L	C	T					0
299	G	M	0				D	S	C	T	W	L	C	T					0
300	G	B	0	G	M		D	S	T	T									0
301	G	B	0	G	M		D	S	T	T									-1
302	F	B	0	F	M		D	S	T	T	D	S	T	D					1
303	F	M	0				D	S	T	T	D	S	T	D					0
304	R	M	0				W	H	T	T	D	S	T	T					0
305	R	M	0				D	S	T	T									0
306	R	M	0				D	S	T	T									0
307	R	M	0				D	S	T	T									0
308	R	M	0				D	S	T	T	W	H	T	T					0
309	G	M	0				W	H	C	T									1
310	R	M	0				D	S	T	T									0
311	R	M	0				D	S	T	T									0
312	G	M	0				W	H	C	T									0
313	G	M	0				D	S	T	T	W	L	T	T					0
314	G	B	0				D	S	T	T	W	L	T	T					0
315	G	M	0				D	S	T	T	W	L	T	T					0
316	R	M	0				D	S	T	T	W	H	T	T					0
317	R	M	0				W	H	T	T	D	S	T	T					0
318	G	M	0				D	S	T	T	W	L	T	T					0
319	R	M	0				D	S	T	T	W	H	T	T					0
320	R	M	0				D	S	T	T									0
321	R	M	0				D	S	T	T									0
322	G	B	0				D	S	T	T	W	L	T	T					0
323	G	B	0				D	S	T	T	W	L	T	T					0
324	G	B	0	G	M		D	S	T	T	W	H	T	T					1
325	F	B	0				D	S	T	T									0
326	R	M	0				D	S	T	T									0
327	F	M	0				D	S	T	T									0
328	R	M	0				D	S	T	T									1
329	R	M	0				D	S	T	T									1

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
283	0	0	0	0	0	1	1
284	0	0	0	0	0	0	-1
285	0	0	-1	0	0	0	-1
286	1	0	1	-1	-1	1	1
287	0	0	0	0	0	-1	-1
288	0	0	0	-1	1	2	1
289	0	0	0	0	0	0	-1
290	0	0	0	0	0	0	-1
291	0	0	0	0	0	0	-1
292	0	0	0	0	0	0	-1
293	0	0	0	-1	-1	0	-1
294	0	1	1	-1	0	1	1
295	0	2	0	0	0	2	1
296	0	0	0	0	-1	0	-1
297	0	0	0	0	-1	-1	-1
298	0	0	0	0	-1	0	-1
299	0	0	0	0	-1	0	-1
300	0	0	0	0	-1	-1	0
301	0	0	0	0	0	-2	-1
302	0	0	0	0	0	1	1
303	0	0	0	0	0	0	-1
304	0	0	0	-1	0	0	-1
305	0	0	0	0	-1	-2	-1
306	0	0	0	0	0	0	-1
307	0	0	0	0	0	0	0
308	0	0	0	0	0	0	1
309	0	0	0	1	-1	1	1
310	0	0	0	0	-1	-1	-1
311	0	0	0	0	-1	1	1
312	0	0	0	-1	-1	0	-1
313	0	0	0	0	-1	0	1
314	0	0	0	0	-1	0	1
315	0	0	0	0	-1	0	1
316	0	0	0	-1	0	1	0
317	0	0	0	0	0	-1	-1
318	0	0	1	0	0	1	1
319	0	0	0	0	0	0	-1
320	0	0	0	0	0	0	1
321	0	0	0	0	0	0	1
322	0	0	0	0	-1	0	1
323	0	0	0	0	-1	0	1
324	0	1	0	1	-1	1	1
325	0	0	0	0	0	1	1
326	0	0	0	0	0	0	-1
327	0	0	0	0	0	-2	-1
328	0	0	0	0	-1	1	1
329	0	1	0	0	0	2	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
330	97.00	97.00	0	FD		0	0	0	2	-1	800000	1	800000		70000		400000	1	400000
331	140.00	140.00	2	FD	PD	0	0	0	0	-1	700000	1	700000		133000		600000	1	600000
332	32.00	32.00	0	FD		0	0	0	1	-1	500000	3			175000	325000	400000	3	
333	0.30	0.30	0	FD		0	0	0	2	0	3072	1	3072	0	71	3001	650	1	650
334	56.30	56.30	0	FD		0	0	0	2	-1	250000	1	250000		118000		75000	1	75000
335	1.50	1.50	0	FD		0	0	0	2	-1	8679	1	8679	0	300	8379	725	1	725
336	4.40	4.40	2	HD	PD	0	0	0	0	0	9437	1	9437	0	1087	8350	6436	1	6436
337	0.30	0.30	0	PD		0	0	0	0	0	2913	3			383	2530	2458	3	
338	0.80	0.80	0	PD		0	0	0	0	0	1740	1	1748	0	361	1379	1121	1	1121
339	0.70	0.70	0	PD		0	0	0	0	0	2733	1	2733	0	343	2390	1352	1	1352
340	1.60	1.60	0	PD		0	0	0	0	0	3608	1	3608	0	340	3268	3955	1	3955
341	0.80	0.80	0	PD		0	0	0	0	0	3343	1	3343	0	279	3064	1798	1	1798
342	0.80	0.80	0	PD		0	0	0	0	0	1747	1	1747	0	167	1580	1952	1	1952
343	1.60	1.60	0	PD		0	0	0	1	1	3690	1	3690	0	138	3552	2629	1	2629
344	1.20	1.20	0	FD		0	0	0	0	-1	1697	1	1697	0	192	1505	1428	1	1428
345	1.20	1.20	0	FD		0	0	0	0	-1	1256	1	1256	0	133	1123	1565	1	1565
346	0.80	0.80	0	FD		0	0	0	0	-1	4453	3			273	4180	1546	3	
347	1.80	1.80	0	FD		0	0	0	0	1	12812	1	12812	0	336	12476	10358	3	
348	0.70	1.00	0	FD		0	0	0	0	1	4515	1	4515	0	94	4421	5182	1	5182
349	0.70	0.70	0	FD		0	0	0	0	1	4508	1	4508	0	223	4285	5177	1	5177
350	43.00	43.00	0	FD		0	0	0	0	-1	275000	3			80000	195000	300000	3	
351	105.00	105.00	0	FD		0	0	0	0	1	400000	3			100000	300000	450000	3	
352	130.00	130.00	0	FD		0	0	0	1	1	750000	1	750000		55000		450000	3	
353	0.70	0.70	0	FD		0	0	0	2	1	5004	1	5004	0	393	4611	3013	1	3013
354	0.80	0.80	0	FD		0	0	0	2	1	5039	1	5039	0	448	4591	2663	1	2663
355	0.30	0.30	0	FD		0	0	0	2	1	1150	1	1150	0	120	1030	400	1	400
356	1.30	1.30	0	FD		0	0	0	2	1	4480	1	4480	0	125	4355	565	1	565
357	1.50	1.50	0	FD		0	0	0	2	1	10345	1	10345	0	895	9450	2420	1	2420
358	0.60	0.60	0	FD		0	0	0	1	1	1611	1	1611	0	130	1481	800	1	800
359	128.00	128.00	1	FD	DL	0	0	1	0	1	725000	3			195000	530000	400000	3	
360	1.00	1.00	0	FD		0	0	0	0	1	4000	1	4000	0	210	3790	350	1	350
361	1.00	1.00	0	FD		0	0	0	0	1	5300	1	5300	0	350	4950	554	1	554
362	70.00	70.00	0	FD		0	0	0	2	1	225000	1			10000		170000	1	
363	150.00	150.00	0	FD		0	0	0	0	1	300000	1			35000		200000	1	
364	72.00	72.00	1	FD	DL	1	0	1	0	1	400000	3			7000	393000	100000	3	
365	1.20	1.20	2	FD	DL	0	0	0	1	1	13208	1	13208	0	185	13023	2090	1	2090
366	53.00	53.00	0	FD		0	0	0	1	1	300000	1	300000		22128		190000	1	190000
367	6.40	6.40	0	FD		0	0	0	0	1	26000	3			4700	21300	13000	3	
368	0.60	0.60	0	FD		0	0	0	0	1	1921	1	1921	0	247	1674	155	1	155
369	0.80	0.80	0	FD		0	0	0	2	1	1420	1	1420	0	140	1280	216	1	216
370	1.30	1.30	0	FD		0	0	0	2	1	1400	1	1400	0	308	1092	458	1	458
371	1.50	1.50	0	FD		0	0	0	2	1	9230	1	9230	0	620	9081	670	1	670
372	4.00	4.00	0	FD		0	0	0	0	1	18000	1	18000	0	1589	16411	10000	1	10000
373	104.00	104.00	0	FD		0	0	0	0	1	500000	1	500000		77448		300000	1	300000
374	0.90	0.90	0	FD		0	0	0	0	1	5336	1	5336	0	352	4984	3245	1	3245
375	1.00	1.00	0	FD		0	0	0	0	1	5427	1	5427	0	376	5051	1899	1	1899
376	1.00	1.00	0	FD		0	0	0	0	1	5365	1	5365	0	340	5025	1940	1	1940

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
330		120000		0	9			6473					0	252			2500		30	330	
331		140000		0				6400					0	200			4000		70	770	
332		152500	247500	0	9								0	180							
333	0	72	578	0	0	0	0	36	0	0	0	0	0	0	0	0	24	0	0	0	0
334		128000		0				3719					0							800	
335	0	386	339	0	12			346		6	0		0	0	0	0		0	0		0
336	0	730	5706	0	0	0	0	36		0			0	0	0	0	24		0		
337		471	1987	0	0	0	0	32		0			0	0	0	0	24		0		
338	0	54	1067	0	0	0	0	18		0			0	0	0	0	10	7	0		
339	0	186	1166	0	0	0	0	18		0			0	0	0	0	14		0		
340	0	87	3868	0	0	0	0	36		0			0	0	0	0	20		0		
341	0	541	1257	0	0	0	0	48		0			0	0	0	0	28		0		
342	0	293	1659	0	0	0	0	18		0			0	0	0	0	20		0		
343	0	107	2522	0	0	0	0	48		0			0	0	0	0	24		0		
344	0	18	1410	0	0	0	0	12		0			0	0	0	0	20		0		
345	0	19	1546	0	0	0	0	0		0	0		0	0	0	0	20		0		
346		437	1109	0	0	0	0	48		0			0	0	0	0	20		0		
347		1074	9284	0				138					0				144				
348	0	568	4614	0				54			0		0				72			0	
349	0	506	4671	0				69					0				54				
350		35466	264534	0				3000					0	144			3000		72		
351		40000	410000	0	20			4500		20			0				4500			600	
352		50000	400000	0	350	150	200	7000					0	0	0	0	4000			300	
353	0	1853	1160	0	10	0	10	29					0	0	0	0	27		0		
354	0	1243	1420	0	8	0	8	29		5			0	0	0	0	48		0		
355	0	400	0	0	5	0	5	0		0	0		0	0	0	0			0		
356	0	181	384	0	12	12	0	36					0	0	0	0	0		0		
357	0	1610	810	0	30	0	30	58					0	0	0	0	30		0		
358	0	500	300	0	0	0	0	14		0			0	0	0	0	24		0		
359		170000	230000	0	350			7000					0				3700			500	
360	0	116	234	0				36					0				11			6	
361	0	276	278	0				36					0				6			6	
362		30000		0	462	96	366	2000					0				1500			400	
363		80000		0									0							100	
364		20000	80000	0	287	287	0	3010	800				0	0	0	0	1000				
365	0	1076	1014	0	0	0	0	76		0			0	0	0	0	10		0		
366		21448		0	189	189	0	2700	821				0							200	
367		4000	9000	0	72	72	0	192					0	0	0	0	202		0	25	
368	0	83	72	0	3	3	0	12		0	0		0	0	0	0	50		0	3	
369	0	120	96	0	3	3	0	17		0	0		0	0	0	0	8		0	8	
370	0	241	217	0	12	12	0	96		0	0		0	0	0	0	20		0	2	
371	0	450	217	0	24	24	0	96		0			0	0	0	0	28		0	4	
372	0	500	9500	0				144					0	0	0	0	177		0		
373		75068		0									0							700	
374	0	192	3053	0	11	11	0	36					0	0	0	0	35		0		
375	0	114	1785	0	13	13	0	36		13			0	0	0	0	18		0		
376	0	61	1879	0	13	13	0	36					0	0	0	0	20		0		

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
330	1	-1	0	0	1	48.6	1	1	-1	1	-1	0	1	1	1	0	-1	0	FF	
331	1	-1	1	0	1	28	2	1	-1	0	-1	0	0	0	0	0	-1	0	FF	
332	1	-1	1	0	1	22	1	1	0	1	-1	0	1	1	1	0	-1	0	FF	
333	1	0	0	0	1	0	2	1	0	0	0	1	1	1	0	0	-1	0	FF	
334	0	0	0	0	1	48	1	1	-2	0	-1	0	0	0	0	0	-1	-1	FF	
335	0	0	0	0	0	1.6	1	0	0	0	-1	1	1	2	1	0	-1	-1	FF	
336	-1	0	0	0	0	0.5	2	0	0	0	0	0	0	0	0	0	-1	0	FF	
337	0	0	0	0	1	0.9	1	2	0	0	0	0	0	0	0	0	-1	0	FF	
338	0	0	0	0	0	0	1	0	0	0	0	0	-1	0	0	0	-1	0	FF	
339	-1	0	0	0	0	1	2	0	1	0	0	0	-1	0	0	0	-1	0	FF	
340	-1	0	0	0	-1	0.8	1	0	-1	0	0	-1	-1	0	0	0	-1	0	FF	EE
341	0	0	0	0	1	1.6	2	0	0	0	0	0	0	0	1	0	-1	-1	FF	
342	0	0	0	0	1	0.8	2	2	0	0	0	0	0	0	0	0	-1	-1	FF	
343	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
344	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	0	-1	-1	FF	
345	0	0	0	0	1	0	1	-1	0	0	0	-1	0	0	0	0	-1	-1	FF	
346	0	0	0	0	1	0.7	1	0	0	0	0	0	0	0	0	0	-1	-1	FF	
347	0	0	0	0	1	1.5	1	0	0	0	0	0	1	0	0	0	-1	-1	FF	EE
348	0	0	0	0	1	1.5	1	0	0	0	0	0	1	0	0	0	-1	0	FF	
349	0	0	0	0	1	1.5	1	0	0	0	0	0	1	0	0	0	-1	0	FF	EE
350	0	0	1	0	1	11.5	1	0	-1	0	0	-1	0	0	0	0	-1	0	FF	
351	0	0	1	0	1	8.100001	1	0	-1	0	0	-1	-1	0	0	0	-1	-1	DE	
352	0	0	0	0	1	11	1	0	1	1	0	0	1	1	0	0	-1	-1	FF	
353	0	0	0	0	1	4.5	1	0	1	0	1	0	1	1	0	0	-1	-1	FF	
354	0	0	0	0	1	4.4	1	0	1	0	1	0	1	1	0	0	-1	-1	FF	
355	0	0	0	0	1	2	1	0	1	0	0	0	1	1	1	0	-1	-1	FF	
356	0	0	1	0	1	2.3	1	0	1	0	0	1	0	1	1	0	-1	-1	FF	
357	0	0	0	0	1	6	1	0	1	0	1	1	1	1	0	0	0	-1	FF	
358	0	0	0	0	1	3.5	1	0	1	0	0	0	1	1	0	0	-1	-1	FF	
359	0	0	1	0	1	26	2	0	1	1	1	0	1	0	0	0	-1	-1	FF	
360	0	0	1	0	1	3.5	1	0	1	1	1	1	0	0	1	0	-1	-1	FF	
361	0	0	1	0	1	1.5	1	0	1	1	1	2	0	0	1	0	-1	-1	FF	
362	0	0	1	1	1	18	1	1	1	1	1	0	1	1	0	0	-1	-1	FF	
363	0	0	1	1	1	61.5	1	1	1	1	1	0	1	0	0	0	-1	-1	FF	
364	0	0	0	0	1	22.5	1	0	1	1	1	1	1	0	0	0	-1	-1	EE	LF
365	0	0	0	0	1	8.6	1	0	1	1	1	1	1	1	1	0	-1	-1	FF	
366	0	0	0	0	1	15.2	1	-1	1	1	1	0	0	1	0	0	-1	-1	FF	
367	0	0	0	0	1	5.2	2	0	1	1	1	0	1	0	0	0	-1	-1	FF	
368	0	0	0	0	1	3.1	1	0	1	1	1	1	0	0	1	0	-1	-1	FF	
369	0	0	0	0	1	0.1	1	0	0	0	0	1	0	1	0	0	-1	-1	EE	LF
370	0	0	0	0	1	3	1	0	1	0	0	1	0	1	1	0	-1	-1	FF	
371	0	0	0	0	1	3	1	0	1	1	1	1	1	1	1	0	-1	-1	FF	
372	0	0	0	0	1	0.3	2	-1	1	1	1	0	0	0	0	0	-1	-1	FF	
373	0	0	0	0	1	16.8	2	0	1	1	1	0	0	0	0	0	-1	-1	FF	
374	0	0	0	0	1	2.1	2	-1	1	1	0	0	0	0	0	0	-1	-1	FF	
375	0	0	0	0	1	1.3	2	-1	0	1	0	0	0	0	0	0	-1	-1	FF	
376	0	0	0	0	1	1.6	2	-1	0	1	0	0	0	0	0	0	-1	-1	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
330					DD						1	1918	3	21		1918	3	26	
331					DD						1	1918	3	27		1918	4	9	
332					DD	FF					1	1918	4	9		1918	4	30	
333					DD						1	1918	4	14	30	1918	4	14	230
334					DD	FF					1	1918	5	27		1918	6	3	
335					DD						5	1918	5	28	645	1918	5	28	720
336					DD	FF					2	1918	6	6	345	1918	6	6	1230
337					DD	FF					1	1918	6	6	345	1918	6	6	1230
338					DD						1	1918	6	6	1700	1918	6	6	2100
339					DD						1	1918	6	6	1700	1918	6	6	2130
340	RF				DD	FF					1	1918	6	6	1700	1918	6	7	300
341					DD	FF					1	1918	6	11	430	1918	6	11	900
342					DD	EE	LR				1	1918	6	12	1730	1918	6	12	2030
343					DD						1	1918	6	13	300	1918	6	13	530
344					DD						1	1918	6	21	315	1918	6	21	430
345					DD						1	1918	6	23	1900	1918	6	23	2320
346					DD	FF					1	1918	6	25	1700	1918	6	26	600
347	RF				DD	FF					1	1918	7	1	1700	1918	7	2	230
348					DD	FF					1	1918	7	1	1800	1918	7	2	230
349	RF				DD	FF					1	1918	7	1	1700	1918	7	2	300
350					DD	FF					1	1918	6	9		1918	6	13	
351					DD						1	1918	7	15		1918	7	17	
352					DD						1	1918	7	18		1918	7	19	
353					DD						1	1918	7	18	435	1918	7	18	1600
354					DD						1	1918	7	18	435	1918	7	18	1600
355					DD						1	1918	7	18	435	1918	7	18	930
356					DD						1	1918	7	18	435	1918	7	18	930
357					DD						1	1918	7	18	435	1918	7	18	1100
358					DD						1	1918	7	18	435	1918	7	18	800
359					DD						1	1918	7	20		1918	8	1	
360					DD						1	1918	7	21	830	1918	7	21	915
361					DD						1	1918	7	21		1918	7	21	
362					DD						1	1918	8	8		1918	8	11	
363					DD						1	1918	8	21		1918	9	4	
364		EE	RF	FE	DD						1	1918	9	12		1918	9	15	
365					DD						1	1918	9	12	500	1918	9	12	1730
366					DD						1	1918	9	26		1918	10	3	
367					DD	EE	RF				1	1918	10	3		1918	10	6	
368					DD						1	1918	10	3	550	1918	10	3	840
369					DD						1	1918	10	3		1918	10	3	
370					DD						1	1918	10	3	550	1918	10	3	930
371					DD						1	1918	10	3	550	1918	10	3	930
372					DD						1	1918	10	8		1918	10	8	
373					DD	FF					1	1918	10	4		1918	10	31	
374					DD	FF					2	1918	10	4	530	1918	10	4	700
375					DD						1	1918	10	04	0530	1918	10	04	1730
376					DD						1	1918	10	04		1918	10	04	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
330	R	M	0				W	H	T	T									0
331	R	M	0				W	H	T	T									0
332	F	M	0	R	M		W	H	T	T									0
333	R	M	0				D	S	T	T									1
334	G	M	0	R	M		D	S	T	T									-1
335	R	M	0				D	O	T	T									0
336	G	W	0	R	M		D	S	T	T									-1
337	R	M	0	G	M		D	O	T	T	D	S	T	T					0
338	R	M	0	G	W		D	S	T	T									-1
339	G	W	0				D	S	T	T									-1
340	R	M	0	R	W		D	O	T	T	D	S	T	T					-1
341	G	W	0	R	M		W	L	T	T									-1
342	G	W	0				D	O	T	T									-1
343	R	M	0	G	W					T									0
344	G	W	0				D	O	T	T									0
345	G	W	0				D	O	T	T									0
346	G	W	0				D	S	T	T									0
347	R	M	0			U	D	S	T	T									0
348	R	M	0			U	D	S	T	T									0
349	R	M	0			U	D	S	T	T									0
350	R	M	0				D	S	T	T									0
351	R	M	0				D	S	T	T									0
352	R	M	0				D	O	T	T	D	S	T	T					0
353	R	M	0	G	M		D	O	T	T	D	S	T	T					0
354	R	M	0				D	O	T	T	D	S	T	T					0
355	R	M	0				D	O	T	T									0
356	R	M	0				D	O	T	T									0
357	R	M	0				D	O	T	T	D	S	T	T					0
358	R	M	0				D	O	T	T									0
359	R	M	0				D	S	T	T									0
360	R	M	0				W	L	T	T									0
361	R	M	0				W	L	T	T									0
362	R	M	0				W	L	T	T									0
363	R	M	0				D	S	T	T									0
364	R	M	0				W	O	T	T									0
365	R	M	0	R	W		W	H	T	T									0
366	G	W	0	R	M		D	O	T	T	W	L	T	T					0
367	R	M	0				D	S	T	T									0
368	R	M	0				D	S	T	T									0
369	R	M	0				D	S	T	T									0
370	R	M	0				D	S	T	T									0
371	R	W	0				D	S	T	T									0
372	R	M	0				D	S	T	T									0
373	R	M	0	G	W		D	O	T	T	W	L	T	T					0
374	R	M	0	G	M		D	O	T	T	W	L	T	T					0
375	R	M	0	G	M		D	O	T	T	W	L	T	T					0
376	R	M	0	G	M		D	O	T	T	W	L	T	T					0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
330	0	0	0	1	0	1	1
331	0	0	0	0	0	0	0
332	0	0	0	0	0	0	1
333	1	0	1	0	0	0	1
334	0	0	-1	0	0	-1	-1
335	-1	1	0	0	0	0	1
336	-1	1	0	0	-1	0	0
337	-1	1	0	0	-1	0	1
338	-1	1	0	0	-1	0	-1
339	-1	1	0	0	-1	0	0
340	-1	1	0	0	-1	0	-1
341	-1	1	0	0	-1	0	1
342	-1	1	0	0	-1	0	1
343	1	-1	0	0	-1	0	-1
344	-1	1	0	0	-1	0	-1
345	-1	1	0	0	-1	0	-1
346	-1	1	0	0	-1	0	1
347	-1	1	0	0	0	0	1
348	-1	1	0	0	0	0	1
349	-1	1	0	0	0	0	1
350	0	0	0	0	0	0	-1
351	0	0	0	0	0	0	-1
352	0	1	0	0	0	0	1
353	0	1	0	0	0	0	1
354	0	1	0	0	0	0	1
355	0	1	0	0	0	0	1
356	0	1	0	0	0	0	1
357	0	1	0	0	0	0	1
358	-1	1	0	0	0	0	1
359	0	2	0	0	0	0	1
360	0	2	0	0	0	0	1
361	0	2	0	0	0	0	1
362	0	2	1	0	0	0	1
363	0	2	0	0	0	0	1
364	-1	1	0	0	0	0	1
365	-1	1	0	0	0	0	1
366	-1	1	0	0	-1	0	1
367	-1	1	0	0	0	0	1
368	-1	1	0	0	0	0	1
369	-1	1	0	0	0	0	1
370	-1	1	0	0	0	0	1
371	-1	1	0	0	-1	0	1
372	-1	1	0	0	0	0	0
373	-1	2	0	0	-1	0	1
374	-1	2	0	0	-1	0	0
375	-1	2	0	0	-1	0	0
376	-1	2	0	0	-1	0	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
377	1.00	1.00	0	FD		0	0	0	0	1	5461	1	5461	0	242	5219	2587	3	
378	0.80	0.80	0	FD		0	0	0	0	1	5022	1	5022	0	301	4721	3335	1	3335
379	0.90	0.90	0	FD		0	0	0	0	1	4778	1	4778	0	132	4646	2925	1	2925
380	0.90	0.90	0	FD		0	0	0	0	1	2950	1	2950	0	109	2841	2563	1	2563
381	169.00	169.00	2	PD	DL	0	0	0	0	1	600000	1	600000		30426		380140	1	380140
382	0.50	0.50	2	PD	DL	0	0	0	0	1	1210	1	1210	0	25	1185	296	1	296
383	1.10	1.10	2	PD	DL	0	0	0	0	1	1989	1	1989	0	110	1879	1655	1	1655
384	144.00	144.00	0	FD		0	0	0	0	-1	840000	3			150000	690000	784000	3	
385	24.00	24.00	0	FD		0	0	0	2	1	51170	1	51170	0	3378	47792	18250	1	18250
386	90.00	90.00	1	PD	FD	1	1	0	0	-1	124000	1	124000	0	2940	121060	120000	1	120000
387	61.00	61.00	0	FD		0	0	0	2	1	220476	1	220476	0	13560	206916	105223	1	105223
388	61.00	61.00	0	FD		0	0	0	2	1	220476	1	220476	0	6140	214336	105223	1	105223
389	61.00	61.00	0	FD		0	0	0	0	1	214336	1	214336	0	3000	211336	101528	1	101528
390	61.00	61.00	0	FD		0	0	0	0	1	211000	1	211000	0	4420	206580	97000	1	97000
391	0.60	1.60	0	HD		0	0	0	-2	0	465	1	465	0	27	438	188	1	188
392	25.00	25.00	0	HD		0	0	0	2	0	10300	1	10300	0	450	9850	22019	1	22019
393	32.00	32.00	0	FD		0	0	0	0	1	24098	1	24098		1120		5000	1	5000
394	13.00	13.00	2	HD	PD	0	0	0	1	1	12917	1	12917	0	1154	11763	4250	1	4250
395	6.00	6.00	2	HD	PD	0	0	0	1	1	12917	1	12917	0	1530	11387	4250	1	4250
396	11.00	11.00	2	HD	PD	0	0	0	1	1	12447	1	12447	0	251	12196	8390	1	8390
397	4.80	4.80	0	HD		0	0	0	0	-1	14730	1	14730		1112		11230	1	11230
398	14.50	14.50	0	HD		0	0	0	0	-1	15000	1	15000		900		12917	1	12917
399	9.70	9.70	0	HD		0	0	0	0	-1	14733	1	14733		702		12691	1	12691
400	12.00	12.00	0	DL		0	0	0	0	1	14730	1	14730	0	300	14430	6995	1	6995
401	7.50	7.50	0	DL		0	0	0	0	1	15576	1	15576		386		6702	1	6702
402	14.50	14.50	0	PD		0	0	0	0	-1	13300	1	13300		400		18912	1	18912
403	1.50	1.50	0	PD		0	0	0	0	1	14557	1	14557		370		8068	1	8068
404	9.00	9.00	0	DL		0	0	0	0	1	18210	1	18210		140		6435	1	6435
405	2.00	2.00	0	PD		0	0	0	0	1	16857	1	16857	0	420	16437	8000	1	8000
406	9.60	9.60	0	PD		0	0	0	0	1	17765	1	17765		500		8158	1	8158
407	8.00	8.00	0	DL		0	0	0	0	1	21265	1	21265		133		6435	1	6435
408	9.00	9.00	0	PD		0	0	0	1	1	18476	1	18476		267		7250	1	7250
409	5.20	5.20	0	DL		0	0	0	0	1	17034	1	17034		65		5152	1	5152
410	9.00	9.00	0	PD		0	0	0	0	1	14600	1	14600		125		8138	1	8138
411	9.00	9.00	0	PD		0	0	0	0	1	16400	1	16400		200		7239	1	7239
412	9.00	9.00	0	PD		0	0	0	0	1	17500	1	17500		220		8128	1	8128
413	6.40	6.40	0	PD		0	0	0	0	1	14000	1	14000		75		8088	1	8088
414	4.80	4.80	0	PD		0	0	0	0	1	16870	1	16870		416		6321	1	6321
415	5.00	5.00	0	FD		0	0	0	0	1	19513	1	19513		240		6750	1	6750
416	6.00	6.00	0	FD		0	0	0	0	1	16600	1	16600		361		6566	1	6566
417	8.00	8.00	0	FD		0	0	0	0	1	17404	1	17404		155		6566	1	6566
418	0.50	0.50	2	HD	PD	0	0	0	0	-1	7942	1	7942		34		5200	1	5200
419	4.50	4.50	0	FD		0	0	0	0	1	16350	1	16350		165		7942	1	7942
420	2.00	2.00	0	FD		0	0	0	0	1	17765	1	17765		250		7588	1	7588
421	2.00	2.00	0	FD		0	0	0	0	1	20744	1	20744		550		3288	1	3288
422	1.00	1.00	0	FD		0	0	0	0	1	5551	1	5551		80		3288	1	3288
423	7.00	7.00	0	HD		0	0	0	1	1	19350	1	19350		1158		6750	1	6750

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
377		250	2337	0	10	10	0	36					0	0	0	0	33				
378	0	173	3162	0	3	3	0	32					0	0	0	0	36		0		
379	0	126	2799	0	0	0	0	32		0			0	0	0	0	22		0		
380	0	250	2313	0	0	0	0	32		0			0	0	0	0	31		0		
381		29491		0									0							275	
382	0	30	266	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
383	0	182	1473	0	0	0	0	0		0	0		0	0	0	0	24		0		
384		69079	714921	0		0	0	7500		0	70		0		0	0	7043		0		
385	0	7000	11250	0	0	0	0	384	200	0			0	0	0	0	150	10	0		
386	0	1750	118250	0	515			558		50	15	41	0	450			576	2680	67	0	68
387	0	15995	89228	0	1037	119	918	908	11586	500	2	97	0	593	51	542	592	3120	591	197	84
388	0	3695	101528	0	1037	119	918	908		302	2	16	0	593	51	542	592		127		12
389	0	4500	97028	0	745	88	657	906		38			0	470		352			180		
390	0	7800	89200	0	700			906		160			0	310					284		
391	0	21	167	0	13	0	13	0	0	9	0	0	0	25	25	0	3	0	7	0	0
392	0	203	21816	0	103	7	96	62	123	42		4	0	75	0	75	124		31	5	
393		605		0	94	22	72	100	75		0	0	0	5	0	5	34		5		
394	0	100	4150	0	0	0	0	138	131	0			0	128	0	128	56	115			
395		120		0	0	0	0	138	131	0			0	38	0	38	46	115			
396	0	60	8330	0	106	17	89	82	18	1			0	78	0	78	90	7			
397	0	1639	9591	0	89	0	89	108	112				0	30	0	30	146	539			
398	514	1164	12267	0	108	0	108	164	112				0	30	0	30	146	40			
399	0	317	12374	0	98	0	98	106	24		1		0	106	17	89	112	170			
400		110		0	97	4	93	152	94				0	58	0	58	80	31			
401		120		0	106	17	89	106	156		0		0	59	0	59	80	10			
402	337	255	18994	0	108	0	108	164	31				0	96	4	92	152	33			
403		80		0	158	3	155	68	0			0	0	39	0	39	45	0			0
404		52		0	106	17	89	104	8		0		0	42	0	42	61	27			
405	0	94	7906	0	73	1	72	160	14				0	22	0	22	59	0			0
406		40		0	51	0	51	199	55				0	39	0	39	45	0			0
407		130		0	106	17	89	89	0		0	0	0	44	0	44	43	53			
408		76		0	106	17	89	113	33		0		0	22	0	22	59	10			
409		103		0	106	17	89	101	54		0		0	55	0		61	116			
410		45		0	158	3	155	68	0			0	0	40	0	40	45	0			0
411		66		0	73	1	72	112	48				0	22	0	22	49	0			0
412		138		0	51	0	51	168	26				0	39	0	39	45	3			
413		44		0	158	3	155	68	0			0	0	39	0	39	45	0			0
414		185		0	106	17	89	92	83				0	30	0	30	41	48			
415		33		0	45	1	44	160	90				0	38	0	38	41	14			
416		142		0	106	17	89	110	238		1		0	54	0	54	50	48			
417		25		0	106	17	89	110	18	2	0		0	54	0	54	50	146			
418		310		0	40	0	40	41	19				0	0	0	0	112	24	0		
419		118		0	106	17	89	106	132		0		0	42	0	42	53	58			
420		20		0	51	0	51	130	26				0	12	0	12	37	0			0
421		141		0	0	0	0	140	156				0	12	0	12	34	0			0
422		20		0	0	0	0	152	221	0			0	12	0	12	34	0			0
423		130		0	71	0	71	242	0	7		0	0	46	0	46	66	28	4		

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
377	0	0	0	0	1	4	1	-1	1	1	0	0	0	0	0	0	-1	-1	FF	
378	0	0	0	0	1	2.5	2	-1	1	1	0	0	0	0	0	0	-1	-1	FF	
379	0	0	0	0	1	1.3	2	-1	1	1	0	0	0	0	0	0	-1	-1	FF	EE
380	0	0	0	0	1	0.8	1	-1	1	1	0	0	0	0	0	0	-1	-1	FF	DE
381	0	0	0	0	1	16.5	1	-1	1	1	1	0	0	0	0	0	-1	-1	FF	
382	0	0	1	0	1	1	1	-1	1	1	0	1	0	0	0	0	-1	-1	FF	
383	0	0	1	0	1	2.9	1	-1	1	1	0	0	0	0	0	0	-1	-1	FF	
384	0	0	0	0	0	0	1	0	-1	0	-1	0	0	0	0	0	-1	0	FF	
385	1	0	0	0	1	70	1	1	1	1	1	0	1	2	2	0	-1	0	FF	
386	0	-1	0	0	1	12	1	0	-1	0	-1	-1	-1	0	0	-1	-1	-1	EE	LR
387	0	1	0	0	1	26	1	0	1	0	1	0	1	1	1	1	-1	-1	FF	
388	0	1	0	0	1	6	2	0	1	0	1	0	1	1	1	1	-1	-1	FF	
389	0	1	0	0	1	7	2	0	1	0	1	0	0	0	0	1	-1	-1	FF	
390	0	1	1	0	1	15	1	0	1	0	1	0	0	0	1	1	-1	0	FF	
391	0	0	0	0	-1	-1.6	1	0	-1	0	0	0	0	-1	0	0	0	0	FF	
392	0	0	0	0	1	0	1	0	-1	1	0	-1	0	1	0	0	0	0	FF	
393	0	1	1	0	1	44	1	0	1	0	1	1	0	0	0	0	-1	0	FF	
394	-1	0	0	0	1	3.9	2	-1	0	0	1	1	1	1	1	0	0	0	FF	
395	-1	0	0	0	1	3.9	1	-1	0	0	1	1	1	1	1	0	0	0	FF	
396	-1	0	0	0	1	3.7	2	-1	-1	0	1	0	0	1	0	0	0	0	FF	
397	1	0	0	0	0	1.6	1	1	0	0	-1	-1	0	0	1	0	0	0	FF	
398	1	0	0	0	0	1.6	1	1	0	0	-1	-1	0	0	0	0	0	0	FF	
399	1	0	0	0	0	4	1	1	0	0	-1	-1	0	0	0	0	0	0	FF	
400	-1	0	1	0	1	2.4	1	-1	1	0	1	0	0	0	0	0	0	0	FF	
401	-1	0	1	0	1	2.4	2	-1	1	0	1	0	0	0	0	0	0	0	FF	
402	1	0	0	0	0	0	1	0	-1	0	-1	-1	0	0	0	0	0	0	FF	
403	0	0	0	0	1	3.6	1	0	0	0	0	0	0	0	1	0	-1	0	RC	
404	0	0	0	0	1	3.2	1	-1	0	0	0	0	0	0	0	0	-1	0	RC	
405	0	0	0	0	1	0	1	-1	0	0	0	0	0	0	0	0	-1	0	RC	
406	0	0	0	0	1	1.6	2	0	0	0	0	0	0	0	0	0	-1	0	RC	
407	0	0	0	0	1	5.6	2	0	0	0	0	1	0	0	0	0	-1	0	FF	DE
408	0	0	0	0	1	4.8	1	0	0	0	0	0	1	1	0	0	-1	0	RC	
409	0	0	0	0	1	5.7	2	0	0	0	0	1	0	0	0	0	-1	0	FF	
410	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	-1	0	RC	
411	-1	-1	0	0	0	2.4	2	0	0	0	0	0	0	0	0	-1	-1	0	FF	
412	-1	0	0	0	0	3.3	2	0	0	0	0	0	0	0	0	0	-1	0	RC	
413	-1	0	0	0	0	4.8	1	-1	0	0	0	0	0	0	0	0	-1	-1	FF	
414	-1	0	0	0	0	3.2	2	0	1	0	1	0	0	0	0	0	-1	0	FF	
415	-1	0	0	0	0	4.8	1	-1	0	0	0	0	0	0	0	0	-1	-1	FF	
416	-1	0	0	0	0	3.2	2	-1	0	0	0	0	0	0	0	0	-1	-1	FF	
417	-1	-1	0	0	0	0.8	1	-1	0	0	0	0	0	0	0	-1	-1	-1	FF	
418	1	0	0	0	1	0.9	1	1	0	0	0	0	0	0	0	0	0	0	FF	
419	-1	-1	0	0	0	0.9	2	-1	0	0	0	0	0	0	0	-1	-1	-1	FF	EE
420	-1	0	0	0	0	1.4	2	-1	1	0	0	0	0	0	0	0	-1	-1	FF	
421	-1	0	0	0	0	4.8	1	0	0	0	0	1	0	0	0	0	-1	0	FF	
422	-1	0	0	0	0	4.8	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
423	-1	0	0	0	1	4.8	1	0	0	0	0	0	1	1	0	0	0	0	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
377					DD						1	1918	10	04	0530	1918	10	04	0700
378					DD						1	1918	10	05	0630	1918	10	05	1730
379	RF				DD						1	1918	10	05		1918	10	05	
380					DD	FF					1	1918	10	09	0830	1918	10	09	1100
381					DD						1	1918	11	01		1918	11	11	
382					DD						1	1918	11	07	0200	1918	11	07	0600
383					DD						1	1918	11	07	0730	1918	11	07	1100
384					DD	FF					1	1918	06	15		1918	06	22	
385		EE	LF		DD						1	1918	09	19		1918	09	20	
386		FE			DD	EE	RR				6	1942	08	31	0130	1942	08	31	0830
387		FE			DD	FF					1	1942	10	23		1942	11	04	
388		FE			DD	FF					1	1942	10	23		1942	10	25	
389					DD	FF					1	1942	10	28		1942	11	01	
390					DD						1	1942	11	02		1942	11	04	
391					DD	DE					1	1942	11	26	0530	1942	11	26	0600
392					DD						2	1943	03	23	0500	1943	03	23	0800
393					DD						1	1943	04	23		1943	05	06	
394					DD	EE	RF				1	1943	09	09		1943	09	11	
395					DD	EE	LF				1	1943	09	09		1943	09	11	
396					DD						1	1943	09	11	1000	1943	09	11	2400
397					DD						1	1943	09	12		1943	09	15	
398					DD						1	1943	09	12		1943	09	15	
399					DD						3	1943	09	13	1310	1943	09	13	1830
400					DD						1	1943	09	17		1943	09	18	
401					DD						1	1943	09	17		1943	09	18	
402					DD						1	1943	09	17		1943	09	18	
403					DD	FF					1	1943	10	12		1943	10	14	
404					DD						3	1943	10	13	0200	1943	10	13	0730
405					DD						1	1943	10	13		1943	10	13	
406		EE	RF		DD	FF					1	1943	10	13		1943	10	14	
407					DD						1	1943	10	13		1943	10	14	
408		FE			DD						2	1943	10	13	0200	1943	10	13	1830
409					DD						1	1943	10	15		1943	10	17	
410					DD						1	1943	10	17		1943	10	18	
411					DD						1	1943	10	16		1943	10	17	
412					DD						1	1943	10	18		1943	10	20	
413					DD						1	1943	10	20		1943	10	22	
414					DD	FF					1	1943	11	04		1943	11	05	
415					DD						1	1943	11	05		1943	11	07	
416		EE	LF		DD						1	1943	11	06		1943	11	07	
417		FF			DD						1	1943	11	06		1943	11	07	
418					DD						1	1943	11	08		1943	11	10	
419	LF	FF			DD	FF					1	1943	11	08		1943	11	10	
420					DD						2	1943	12	01	1700	1943	12	02	0600
421		FF			DD	FF					1	1943	12	02	1800	1943	12	06	0600
422					DD						1	1943	12	02	1630	1943	12	03	1700
423					DD						1	1944	01	25		1944	01	26	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
377	R	M	0	G	M		D	O	T	T	W	L	T	T					0
378	R	M	0	G	M		D	O	T	T	D	S	T	T					0
379	R	M	0	G	M		D	O	T	T	D	S	T	T					0
380	R	M	0	G	M		D	O	T	T									0
381	R	M	0				D	O	T	T	W	H	T	T					0
382	R	M	0				W	H	T	T									0
383	R	M	0				W	L	T	T									0
384	R	M	0				W	H	T	T									0
385	R	B	0				D	S	T	T									1
386	F	D	0	R	D		D	S	T	T	D	S	T	D					0
387	F	D	0	R	D		D	S	T	T	D	S	T	D					0
388	F	D	0	R	D		D	S	T	T	D	S	T	D					0
389	F	D	0	R	D		D	S	T	T	D	S	T	D					0
390	F	D	0	R	D		D	S	T	T	D	S	T	D					0
391	R	D	0				D	S	T	T	D	S	T	T					0
392	R	D	0	G	D		D	S	T	T	D	S	T	D					0
393	G	M	0				D	S	T	T	D	S	T	T					0
394	R	M	0				D	S	T	T									0
395	R	M	0				D	S	T	T									0
396	R	M	0				D	S	T	T									0
397	R	M	0				D	S	T	T									0
398	R	M	0				D	S	T	T									0
399	R	M	0				D	S	T	T									0
400	R	M	0				D	S	T	T									0
401	R	M	0				D	S	T	T									0
402	R	M	0				D	S	T	T									0
403	F	M	0				D	S	T	T									0
404	R	M	0				D	S	T	T									0
405	F	M	0				D	S	T	T									0
406	F	M	0				D	S	T	T									0
407	G	M	0				D	S	T	T									0
408	R	M	0				D	S	T	T									0
409	R	M	0				W	L	T	T									0
410	F	M	0				W	L	T	T									0
411	R	M	0				W	L	T	T									0
412	R	M	0				W	L	T	T									0
413	F	M	0				W	L	T	T	W	H	T	T					0
414	R	M	0				D	S	T	T									0
415	G	M	0				W	L	T	T									0
416	G	M	0				D	S	T	T	W	L	T	T					0
417	G	M	0				W	L	T	T									0
418	G	M	0				W	L	T	T									0
419	G	M	0				W	L	T	T									0
420	G	M	0				W	L	T	T									0
421	G	M	0				W	L	T	T									0
422	G	M	0				W	H	T	T									0
423	F	M	0				W	H	T	T									0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
377	-1	2	0	0	-1	0	1
378	-1	2	0	0	-1	0	1
379	-1	2	0	0	-1	0	1
380	-1	2	0	0	-1	0	1
381	-1	2	0	0	-1	0	1
382	-1	2	0	-1	-1	0	1
383	-1	2	0	-1	-1	0	1
384	0	0	-1	-1	-1	0	-1
385	1	1	0	0	0	1	1
386	0	0	0	0	-1	0	-1
387	0	0	1	0	0	0	1
388	0	0	1	0	0	0	1
389	0	0	0	0	0	0	1
390	0	0	0	0	0	0	1
391	1	0	-1	0	0	-1	-1
392	1	0	-1	0	-1	0	-1
393	0	1	0	0	-1	0	1
394	-1	0	0	1	-1	0	1
395	-1	0	0	1	-1	0	1
396	-1	0	0	0	-1	0	-1
397	1	0	0	0	1	0	-1
398	1	0	0	0	1	0	-1
399	0	1	0	0	1	0	-1
400	-1	0	0	0	-1	0	1
401	-1	0	0	0	-1	0	1
402	1	0	0	0	0	0	-1
403	0	0	0	0	-1	0	1
404	0	0	0	0	-1	0	1
405	0	0	0	0	-1	0	-1
406	0	0	0	0	-1	0	1
407	0	0	0	0	-1	0	1
408	0	0	0	0	-1	0	1
409	0	0	0	-1	-1	0	-1
410	0	0	0	-1	-1	0	1
411	-1	0	0	-1	-1	0	1
412	-1	0	0	-1	-1	0	1
413	-1	0	0	-1	-1	0	-1
414	-1	0	0	0	-1	0	1
415	-1	0	0	-1	-1	0	-1
416	-1	0	0	-1	-1	0	-1
417	-1	0	0	-1	-1	0	-1
418	1	0	0	0	0	0	1
419	-1	0	0	-1	-1	0	0
420	-1	0	0	-1	-1	0	-1
421	-1	0	0	-1	-1	0	1
422	-1	0	0	-1	-1	0	1
423	-1	0	0	0	0	0	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
424	7.00	7.00	0	HD		0	0	0	0	-1	15317	1	15317	0	366	14951	17976	1	17976
425	11.00	11.00	0	PD		0	0	0	0	1	17766	1	17766		742		15098	1	15098
426	11.00	11.00	0	PD		0	0	0	0	-1	26029	1	26029		1318		9834	1	9834
427	8.00	8.00	0	PD		0	0	0	0	-1	26490	1	26490		341		4515	1	4515
428	3.20	3.20	0	PD		0	0	0	0	-1	7418	1	7418		167		5000	1	5000
429	2.00	2.00	0	PD		0	0	0	0	-1	27518	1	27518	0	270	27248	17730	1	17730
430	2.00	2.00	2	FD	PD	0	0	0	0	1	13400	1	13400		101		7077	1	7077
431	9.60	9.60	1	FD	PD	0	1	0	2	-1	41974	1	41974		2238		20496	1	20496
432	4.00	4.00	1	FD	PD	0	1	0	2	-1	21478	1	21478		1451		9761	1	9761
433	8.00	8.00	0	FD		0	0	0	0	-1	15637	1	15637		265		19613	1	19613
434	7.50	7.50	0	FD		0	0	0	1	1	18702	1	18702		531		9250	1	9250
435	5.50	5.50	0	FD		0	0	0	1	1	17970	1	17970		1974		8141	1	8141
436	5.00	5.00	0	FD		0	0	0	0	1	16458	1	16458		537		7500	1	7500
437	5.50	5.50	0	DL		0	0	0	0	1	18308	1	18308		343		8215	1	6853
438	4.00	4.00	0	DL		0	0	0	0	1	23190	1	23190		405		7627	1	7627
439	9.00	9.00	0	HD		0	0	0	0	1	13095	1	13095		203		4563	1	4563
440	6.00	6.00	0	DL		0	0	0	0	1	17912	1	17912		257		6653	1	6653
441	15.00	15.00	0	HD		0	0	0	0	1	18030	1	18030		287		6653	1	6653
442	8.50	8.50	0	FD		0	0	0	0	1	17345	1	17345		234		12569	1	12569
443	6.00	6.00	0	FD		0	0	0	0	1	17313	1	17313		194		11343	1	11343
444	5.60	5.60	0	FD		0	0	0	2	1	22374	1	22374		710		12815	1	12815
445	7.80	7.80	0	FD		0	0	0	2	1	19971	1	19971		1524		11928	1	11928
446	14.00	14.00	0	WD		0	0	0	0	1	17925	1	17925		162		6957	1	6957
447	14.00	14.00	0	FD		0	0	0	-1	1	20683	1	20683	0	767	19916	12327	1	12327
448	6.50	6.50	0	FD		0	0	0	0	1	19047	1	19047		517		10593	1	10593
449	5.00	5.00	0	FD		0	0	0	0	1	18000	1	18000		263		13715	1	13715
450	9.00	9.00	0	FD		0	0	0	0	1	15557	1	15557		245		7659	1	7695
451	11.00	11.00	0	FD		0	0	0	0	1	29711	1	29711		1304		15801	1	15801
452	3.00	3.00	0	FD		0	0	0	0	1	17300	1	17300		825		6108	1	6108
453	5.00	5.00	0	PD		0	0	0	0	1	22641	1	22641		329		13012	1	13012
454	4.00	4.00	0	FD		0	0	0	0	1	23604	1	23604		316		19255	1	19255
455	5.50	5.50	1	HD	PD	1	1	0	0	1	26607	1	26607		710		10111	1	10111
456	7.00	7.00	0	FD		0	0	0	0	1	38011	1	38011		572		10855	1	10855
457	4.00	4.00	0	FD		0	0	0	0	1	15721	1	15721	0	560	15161	3700	1	3700
458	12.00	12.00	0	FD		0	0	0	0	1	18228	1	18228		2777		7500	1	7500
459	21.00	21.00	0	FD		0	0	0	1	1	76213	1	76213		4011		57500	1	57500
460	11.00	11.00	0	FD		0	0	0	0	1	126000	1	126000		1510		30700	1	30700
461	9.00	9.00	0	HD		0	0	0	2	-1	25497	1	25497		4800		27673	3	13690
462	5.00	5.00	0	HD		0	0	0	0	1	15646	1	15646	0	113	15533	8325	1	8325
463	5.00	5.00	0	PD		0	0	0	0	1	17232	1	17232	0	99	17133	6000	1	6000
464	45.00	45.00	0	PD		0	0	0	0	1	40619	1	40619		234		15000	1	15000
465	25.00	25.00	0	DL		0	0	0	0	1	59631	1	59631		1647		41500	1	41500
466	25.00	25.00	0	FD		0	0	0	0	1	60794	1	60794	0	359	60435	39580	1	39580
467	10.40	10.40	0	HD		0	0	0	0	-1	7500	3			779		4800	1	4800
468	12.50	12.50	0	FD		0	0	0	0	1	32283	2	25345	12006	1477	35874	19832	2	10844
469	9.50	9.50	0	FD		0	0	0	0	1	20493	2		3903	3683		20250	3	
470	48.00	48.00	1	FD	DL	0	1	1	1	1	99583	1	99583		4265		23588	1	23588

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
424	0	62	17914	0	92	0	92	130	50				0	71	0	71	242	33			
425		221		0	71	0	71	242	16				0	92	0	92	123	30			
426		1450		0	107	0	107	222	53				0	35	0	35	122	44			
427		369		0	107	0	107	221	18				0	139	0	139	82	7			
428		107		0	27	0	27	58	9				0	0	0	0	76	7			
429	0	311	17419	0	113	0	113	223	0			0	0	100	0	100	226	121			
430		206		0	70	0	70	155	7		0		0	28	0	28	102	0			0
431		1018		0	201	0	201	317	335	56			0	106	17	89	184	1270	38	0	
432		1693		0	24	0	24	167	45				0	59	0	59	185	58			
433		403		0	45	0	45	164	170				0	106	17	89	187	178		0	
434		1035		0	249	51	198	160	109	9	0		0	34	0	34	123	0			0
435		720		0	107	17	90	160	54		0		0	21	0	21	76	0			0
436		442		0	124	34	90	154	40		0		0	21	0	21	73	0			0
437		730		0	249	51	198	166	31		0		0	40	0	40	128	0			0
438		721		0	225	68	157	159	0		0	0	0	30	0	30	58	0			0
439		332		0	130	34	96	132	6		0		0	23	0	23	40	0			0
440		380		0	104	28	76	126	8		0		0	26	0	26	40	32			
441		380		0	131	34	97	148	6		0		0	26	0	26	40	0			0
442		468		0	35	0	35	100	16				0	0	0	0	92	0	0		0
443		107		0	36	0	36	100	35				0	19	0	19	96	0			0
444		1355		0	424	152	272	152	247	93	0		0	89	0	89	107	0	51	2	0
445		1617		0	106	17	89	201	150	15			0	49	0	49	85	0			0
446		227		0	110	17	93	138	8		0		0	52	0	52	88	0			0
447	0	1319	11008	0	462	158	304	92	8	18			0	65	0	65	64	0			0
448		580		0	102	13	89	97	0		1	0	0	19	0	19	106	0			0
449		598		0	102	13	89	93	0			0	0	71	0	71	117	0			0
450		374		0	35	0	35	104	0			0	0	0	0	0	64	0	0		0
451		1379		0	281	77	204	146	35	80	1		0	100	0	100	117	11			
452		698		0	0	0	0	94	371				0	46	0	46	61	11			
453		1178		0	106	17	89	115	66		0		0	30	0	30	112	1			
454		884		0	156	17	139	121	38	8	0		0	35	0	35	202	2	12		
455		568		0	126	7	119	146	121	7			0	31	0	31	110	0	8		0
456		850		0	71	0	71	200	3				0	0	0	0	125	0	0		0
457		560		0	70	17	53	145	100				0	0	0	0	29	0	0		0
458		2350		0	107	17	90	120	33			0	0	23	0	23	84	3			0
459		5000		0	1369	205	1164	720	4000	493			0	528	0	528	292		200		
460		5000		0	650	176	474	792	800				0	62	0	62	318	0			
461	13983	2673	25000	0	120	0	120	218		100			0	340	118	222	192	100			
462	0	579	7746	0	317	78	239	146	0			0	0	15	0	15	76	0			0
463	0	362	5638	0	318	79	239	146	46	21			0	16	4	12	32	0			0
464		906		0	472	137	335	296	73	21			0	38	0	38	80	0	3		0
465		1700		0	585	154	431	520	338	19			0	160	0	160	248	0	30		0
466	0	210	39370	0	472	137	335	296	30				0	88	0	88	248	0			0
467		119		0	126	0	126	12	0	87		0	0	122	35	87	48	130	25		
468	16290	3616	23518	0	312			234		79	0		0	63	0	63	116	79	49	0	
469		3000	17250	0	91	17	74	162		47			0	66	0	66	107				
470		4880		0	764	199	565	543	52	89			0	71			99	0	14		0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
424	0	0	0	0	1	0	1	0	0	0	0	-1	0	0	0	0	0	1	FF	
425	-1	0	0	0	1	6.9	2	0	0	0	0	0	0	0	0	0	0	0	FF	
426	1	0	0	0	1	4	2	1	0	0	0	0	1	0	1	0	0	0	DE	
427	1	0	0	0	1	2.8	1	0	-1	0	0	0	0	0	1	0	-1	-1	FF	
428	0	0	0	0	1	2.8	2	0	0	0	0	0	0	0	0	0	-1	-1	RC	
429	0	0	0	0	1	0.6	1	0	0	0	-1	0	0	0	0	0	-1	1	FF	
430	1	0	0	0	1	0	1	0	0	0	0	0	-1	0	0	0	-1	-1	FF	
431	0	0	1	0	1	2.8	1	0	0	0	-1	0	1	1	1	0	-1	-1	FF	
432	1	0	1	0	1	2	1	1	-1	0	0	0	1	1	1	0	-1	0	RC	
433	-1	0	0	0	0	0	1	0	0	0	0	-1	0	0	0	0	-1	-1	FF	
434	0	0	0	0	1	3.2	1	0	1	0	1	0	0	1	0	0	-1	0	FF	
435	0	0	0	0	1	1.2	2	0	1	0	1	0	0	1	0	0	-1	0	FF	
436	0	0	1	0	1	4	1	0	1	0	1	0	0	0	0	0	-1	0	FF	
437	0	0	1	0	1	4.8	1	0	0	0	1	0	0	0	0	0	0	0	FF	
438	0	0	1	0	1	8.7	1	0	0	1	1	0	0	0	0	0	0	0	FF	
439	0	0	1	0	1	2.4	1	0	1	0	0	0	1	0	0	1	0	0	FF	
440	1	0	1	0	1	1.8	1	0	1	1	0	0	0	0	0	0	0	0	FF	EE
441	1	0	1	0	1	4.8	1	0	1	1	0	0	0	0	0	0	0	0	FF	EE
442	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	-1	-1	RC	
443	0	0	0	0	1	0	2	0	0	0	0	0	1	0	0	0	-1	-1	FF	
444	0	0	0	0	1	14.4	1	0	1	0	1	0	1	1	0	0	-1	-1	FF	
445	0	0	0	0	1	14.4	1	0	1	0	1	0	1	1	0	0	-1	-1	FF	
446	0	0	0	0	1	15.9	1	0	0	0	1	0	0	0	0	0	0	1	FF	
447	-1	0	1	0	1	1.6	1	-1	0	0	1	0	0	-1	0	0	-1	-1	FF	
448	-1	0	0	0	1	3.3	2	-1	0	0	1	0	0	0	0	0	-1	0	FF	
449	-1	0	0	0	1	1	1	-1	0	0	1	0	0	0	0	0	-1	0	FF	
450	0	0	0	0	1	6.3	2	0	1	0	0	0	0	0	0	0	-1	0	RC	FF
451	0	0	0	0	1	2.7	1	0	0	0	0	-1	0	0	1	0	-1	-1	FF	
452	-1	0	0	0	1	2.4	1	-1	0	-1	1	0	0	0	0	0	-1	0	FF	
453	0	0	1	0	1	4.4	1	0	1	1	1	0	0	0	0	0	-1	1	FF	
454	-1	0	0	0	1	0.8	2	0	0	0	1	0	0	0	0	0	-1	1	FF	
455	0	0	1	0	1	5.2	1	0	1	1	1	0	0	0	0	0	0	1	FF	
456	-1	0	0	0	1	4.8	2	0	0	0	0	1	0	0	0	0	-1	0	FF	
457	0	0	0	0	0	4	1	0	1	0	1	1	1	0	1	0	-1	0	FF	
458	0	1	0	0	1	8	1	0	1	0	1	0	0	0	0	1	-1	-1	FF	
459	0	1	0	0	0	9.600001	1	0	-1	0	1	0	0	1	-1	1	-1	-1	FF	
460	0	1	0	0	1	11.2	1	0	1	1	2	1	1	0	1	1	-1	1	FF	
461	0	-1	0	0	1	0	1	0	-1	0	-2	-1	0	1	1	0	0	0	FF	
462	0	1	1	0	1	6	2	0	0	1	0	0	0	0	0	0	0	0	DE	
463	0	1	1	0	1	21.9	1	0	0	1	0	0	0	0	0	0	-1	0	RC	
464	0	1	1	0	1	38.1	1	0	0	1	1	0	0	0	0	0	-1	0	RC	
465	0	0	0	0	0	31.8	2	0	0	0	1	0	0	0	0	0	-1	-1	RC	
466	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	-1	-1		
467	0	0	0	0	-1	-3.2	1	0	0	0	-1	0	0	0	0	0	0	0	FF	
468	0	0	0	0	1	7.8	1	0	1	1	0	0	0	0	1	0	-1	-1	RC	FF
469	0	-1	0	0	0	4.8	1	-1	0	0	0	0	-1	0	0	0	-1	-1	RC	FF
470	0	1	1	0	1	14	1	0	0	1	1	1	1	0	0	0	-1	-1	RC	FF

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
424		DE			DD						1	1944	01	27		1944	01	27	
425					DD						3	1944	01	29	2300	1944	01	30	0700
426		FF			DD						3	1944	02	03	1500	1944	02	03	1830
427					DD	FF					1	1944	02	07	2200	1944	02	08	1800
428					DD						1	1944	02	07		1944	02	09	
429		DE	LR	RR	DD						1	1944	02	08	2400	1944	02	09	1300
430					DD						2	1944	02	11	0630	1944	02	11	1630
431					DD	DE					6	1944	02	16	0600	1944	02	16	1830
432					DD	FF					1	1944	02	16		1944	02	19	
433					DD						1	1944	02	21		1944	02	23	
434		FF			DD						2	1944	05	11	2300	1944	05	12	1200
435		FF			DD						2	1944	05	11	2400	1944	05	12	2000
436		FF			DD						2	1944	05	14	1500	1944	05	14	2100
437		FF			DD						2	1944	05	14	0400	1944	05	14	1200
438					DD						1	1944	05	16		1944	05	18	
439					DD						1	1944	05	17	1430	1944	05	19	0600
440	RF				DD						1	1944	05	20		1944	05	22	
441	LF	FF			DD						3	1944	05	22	1400	1944	05	22	2000
442					DD	FF					2	1944	05	23	0600	1944	05	23	1130
443					DD	FF					1	1944	05	23		1944	05	24	
444					DD						3	1944	05	23	0630	1944	05	23	2000
445					DD						3	1944	05	23	0630	1944	05	23	1900
446					DD						1	1944	05	25		1944	05	27	
447		FF			DD						1	1944	05	26	1300	1944	05	26	1930
448					DD	FF					1	1944	05	26		1944	05	28	
449					DD	FF					1	1944	05	27		1944	05	28	
450					DD						1	1944	5	28		1944	5	30	
451					DD	FF					1	1944	5	29		1944	5	31	
452					DD	FF					1	1944	5	29		1944	6	1	
453					DD						2	1944	6	1	500	1944	6	1	1930
454					DD	FF					2	1944	6	1	530	1944	6	1	1900
455					DD	FF					2	1944	6	1	500	1944	6	1	2100
456					DD						1	1944	6	3		1944	6	4	
457		FF			DD						1	1944	9	13		1944	9	17	
458					DD	FF					1	1944	7	11		1944	7	18	
459					DD						3	1944	7	18	745	1944	7	18	1900
460					DD						1	1944	7	24		1944	7	26	
461					DD	FF					1	1944	8	7	1	1944	8	12	
462					DD						1	1944	8	16		1944	8	16	
463		RC			DD						1	1944	8	23		1944	8	25	
464		RC			DD	FF					1	1944	8	23		1944	8	25	
465					DD	FF					1	1944	9	6		1944	9	11	
466											1	1944	9	13		1944	9	13	
467					DD	FF					3	1944	9	19	730	1944	9	19	1400
468					DD	FF					6	1944	10	2	1100	1944	10	2	1830
469					DD	DE	FF				1	1944	11	2		1944	11	13	
470					DD						1	1944	11	8		1944	11	12	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
424	F	M	0				D	S	C	T									0
425	F	M	0				D	S	C	T									0
426	F	M	0				D	S	T	T	W	L	T	T					0
427	F	M	0				D	S	C	T									0
428	F	M	0				D	S	C	T									0
429	F	M	0				D	S	C	T									0
430	F	M	0				W	L	T	T									0
431	F	M	0				D	S	T	T									0
432	F	M	0				D	S	C	T									0
433	R	M	0				W	L	T	T	D	S	T	T					0
434	G	B	0				D	S	T	T									0
435	G	B	0				D	S	T	T									0
436	G	B	0				D	S	T	T									0
437	G	B	0				D	S	T	T									0
438	G	B	0				D	S	T	T									0
439	R	M	0				D	S	T	T									0
440	G	M	0				D	S	T	T									0
441	G	M	0				D	S	T	T									0
442	F	M	0				W	L	T	T									0
443	F	M	0				W	L	T	T									0
444	F	M	0				W	L	T	T									0
445	F	M	0				W	L	T	T									0
446	R	M	0				D	S	T	T									0
447	R	M	0				D	S	T	T									-1
448	R	M	0				D	S	T	T									0
449	R	M	0				D	S	T	T									0
450	R	M	0				D	S	T	T									0
451	R	M	0				D	S	T	T									0
452	R	M	0				D	S	T	T									0
453	R	M	0				D	S	T	T									0
454	R	B	0				D	S	T	T									0
455	R	M	0				D	S	T	T									0
456	F	M	0				D	S	T	T									0
457	R	M	0				D	S	T	T	W	L	T	T					0
458	R	M	0				D	O	T	T									0
459	R	M	0				D	S	T	T									0
460	R	M	0				D	S	T	T									0
461	R	M	0				D	S	T	T									0
462	R	M	0				D	S	T	T	D	O	T	T					0
463	R	M	0				W	L	T	T									0
464	R	M	0				W	L	T	T									0
465	R	M	0				W	L	T	T									0
466	R	M	0				W	L	T	T									0
467	R	M	0				W	L	T	T									-1
468	R	M	0				W	L	T	T	D	O	T	T					0
469	R	M	0	G	M		W	L	T	T									0
470	R	M	0				W	H	C	T									0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
424	0	0	0	0	0	0	-1
425	-1	0	0	0	-1	0	1
426	1	0	0	0	-1	0	1
427	1	0	0	0	0	0	-1
428	0	0	0	0	-1	0	0
429	0	0	0	0	0	0	1
430	1	0	0	-1	0	0	-1
431	0	0	0	0	0	0	-1
432	1	0	0	0	-1	0	1
433	0	0	0	0	0	0	-1
434	0	0	0	0	-1	0	1
435	0	0	0	0	-1	0	1
436	0	0	0	0	-1	0	1
437	0	0	0	0	-1	0	1
438	0	0	0	0	0	0	1
439	0	0	0	0	-1	0	1
440	0	0	0	0	-1	0	1
441	0	0	0	0	-1	0	1
442	0	0	0	0	-1	0	0
443	0	0	0	0	-1	0	0
444	0	0	0	1	-1	0	1
445	0	0	0	1	-1	0	1
446	0	0	0	0	0	0	1
447	0	0	-1	0	-1	-1	-1
448	0	0	0	0	0	0	0
449	0	0	0	0	-1	0	-1
450	0	0	0	0	-1	0	1
451	0	0	0	0	-1	0	-1
452	-1	0	0	0	-1	0	-1
453	0	0	0	0	-1	0	1
454	-1	0	0	0	-1	0	0
455	0	0	0	0	-1	0	1
456	-1	0	0	0	0	0	1
457	0	0	0	0	-1	0	1
458	0	0	0	0	-1	0	1
459	0	0	-1	0	0	0	-1
460	0	0	0	0	0	0	1
461	0	0	0	0	-1	0	-1
462	0	1	0	0	1	0	0
463	0	1	0	1	-1	0	1
464	0	1	0	0	-1	0	1
465	0	0	0	0	-1	0	0
466	0	0	0	0	-1	0	-1
467	0	0	0	-1	0	-1	-1
468	0	0	0	0	-1	0	1
469	0	0	0	-1	-1	0	-1
470	0	2	0	-1	-1	0	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
471	16.60	16.60	0	FD		0	0	0	0	1	43587	1	43587		720		11185	1	11185
472	7.70	7.70	1	PD	DL	0	1	1	0	1	25881	1	25881		1006		7555	1	7555
473	49.00	49.00	1	FD	DL	0	1	1	0	1	92393	1	92393		3223		28382	1	28382
474	11.30	11.30	1	PD	DL	0	1	1	0	1	10348	1	10348		185		6519	1	6519
475	64.00	64.00	1	PD	DL	0	1	1	0	1	88941	1	88941		3279		32396	1	32396
476	3.50	3.50	0	HD		0	0	0	0	1	7935	1	7935		58		5366	1	5366
477	11.30	11.30	0	PD		0	0	0	0	1	15871	1	15871	0	56	15815	6999	1	6999
478	11.30	11.30	1	PD	DL	0	1	1	0	1	16232	1	16232		110		6713	1	6713
479	51.20	51.20	1	PD	DL	0	1	1	0	1	90078	1	90078		482		30712	1	30712
480	4.50	4.50	0	PD		0	0	0	0	1	19773	1	19773		234		6044	1	6044
481	32.00	32.00	0	DL		0	0	0	0	1	89977	1	89977		835		31501	1	31501
482	3.60	3.60	0	FD		0	0	0	0	1	15224	1	15224	0	155	15069	5044	1	5044
483	14.50	14.50	0	HD		0	0	0	2	-1	10000	3			268	9732	8634	3	
484	12.00	12.00	1	HD	PD	1	0	0	0	-1	87000	3			4306	82694	19996	3	
485	12.00	12.00	1	HD	DL	0	1	1	0	-1	36678	3			3000	33678	4849	3	
486	9.00	9.00	0	PD		0	0	0	2	1	48000	1	48000		800		60000	1	60000
487	8.00	8.00	2	HD	PD	0	0	0	1	1	7000	1	7000	0	600	6400	12000	1	12000
488	65.00	65.00	0	PD		0	0	0	3	1	132000	1	132000		3960		150000	1	150000
489	700.00	700.00	1	PD	FD	1	1	1	0	1	1100000	1	1100000		253000		1372000	1	1372000
490	1060.00	1060.00	1	HD	PD	1	1	1	2	0	1060300	1	1060300		139000		880000	1	880000
491	36.00	36.00	1	PD	FD	0	1	1	1	-1	54180	1	54180	37300	21327	70153	12035	1	12035
492	13.00	13.00	0	FD		0	0	0	0	0	120000	1	120000		28000		30000	1	30000
493	16.00	16.00	0	FD		0	0	0	0	1	62000	1	62000		1364		45000	1	45000
494	30.00	30.00	0	PD		0	0	0	0	1	140000	1	140000	0	3180	136820	75000	1	75000
495	20.00	20.00	1	PD	FD	0	1	1	0	0	60000	3			3500	56500	149000	3	
496	25.00	25.00	1	PD	FD	0	1	1	0	0	56000	1			2900		129000	1	
497	25.00	25.00	0	HD		0	0	0	0	1	78000	1	78000		5700		82300	1	82300
498	250.00	250.00	1	PD	FD	0	1	1	0	1	980600	1	980600		117700		280000	1	280000
499	16.00	16.00	0	FD		0	0	0	0	0	70000	1	70000		11676		15000	1	15000
500	111.00	111.00	0	FD		0	0	0	0	1	524724	1	524724		79000		210000	1	210000
501	180.00	180.00	1	PD	FD	1	1	1	0	0	254950	1	254950		63500		84500	1	84500
502	12.00	12.00	0	FD		0	0	0	0	1	25100	1	25100	0	610	24490	8230	1	8230
503	25.00	25.00	0	FD		0	0	0	0	1	397607	1	397607		35500		72000	1	72000
504	10.00	10.00	0	HD		0	0	0	0	1	16100	1	16100		670		8500	1	8500
505	440.00	440.00	0	PD		0	0	0	1	1	1200000	1	1200000		37400		900000	3	
506	5.50	5.50	1	PD	FD	0	1	0	0	1	39000	1	39000	0	980	38020	3300	1	3300
507	7.00	7.00	0	PD		0	0	0	0	1	38500	1	38500	0	1750	36750	12900	1	12900
508	10.00	10.00	0	PD		0	0	0	0	1	12700	1	12700		1150		5100	1	5100
509	12.00	12.00	0	PD		0	0	0	0	1	17550	1	17550		3040		6400	1	6400
510	590.00	590.00	0	PD		0	0	0	1	1	1250000	1	1250000		135000		800000	1	800000
511	480.00	480.00	0	PD		0	0	0	0	1	2200000	1	2200000		46900		560000	1	560000
512	500.00	500.00	0	FD		0	0	0	0	1	1220000	1	1220000		112000		780000	1	780000
513	2.00	2.00	0	FD		0	0	0	0	0	10800	1	10800		685		3100	1	3100
514	2.50	2.50	0	FD		0	0	0	0	0	12115	1	12115		850		3900	1	3900
515	2.00	2.00	0	FD		0	0	0	0	1	13600	2	13293	1110	474	13929	3710	2	3782
516	12.00	12.00	0	FD		0	0	0	1	1	147000	1	147000		10000		75000	1	75000
517	1.20	1.20	0	FD		0	0	0	0	1	9000	3	5000	4000	3302	5698	4836	1	4836

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
471		446		0	326	78	248	239	13	8			0	20	0	20	152	0	3		0
472		197		0	202	49	153	142	0			0	0	16	0	16	106	0			0
473		2665		0	524	161	363	515	0	38		0	0	63	0	63	169	0	63		0
474		141		0	115	29	86	158	0				0	16	0	16	81	0	8		
475		4942		0	642	160	482	519	20	67			0	66	0	66	207	0	54		0
476		224		0	106	30	76	51	0	4		0	0	30	0	30	64	0	4		0
477	0	233	6766	0	211	59	152	194	0	4		0	0	36	0	36	87	0			0
478		616		0	211	59	152	104	0	10		0	0	43	0	43	81	0			
479		811		0	624	176	448	543	0	20		0	0	75	0	75	456	0			0
480		129		0	237	65	172	156	0	3		0	0	23	0	23	156	0	2		0
481		1774		0	624	176	448	565	19	42			0	42	0	42	193	0			0
482	0	121	4923	0	211	59	152	104	0	13		0	0	18	0	18	99	0	3		0
483		134	8500	0	4	0	4	68	0	2		0	0	40	20	20	60	0	3		0
484		1731	18265	0	251	0	251	94	0	66		0	0	152	40	112	108	0	56		0
485		1151	3698	0	359	0	359	313	0	50		0	0	152	47	105	18	0	103		0
486		5000		0	600	450	150	202	2000				0	200	155	45	192	150			
487	0	1200	10800	0	40	20	20	52	100				0	0	0	0	56	0			0
488		66000		0	765	215	550	366	1200	60			0	852	420	432	324	450	560		
489		885000		0	1800			5746		990		600	0	950			6678		840	3400	590
490		85300		0	667			3440		290	450		0	850			2050		510	210	
491	33872	6534	39373	0	539			876		260	98		0	258			366		110	123	
492		4150		0	316	90	226	1173	350				0	20	0	20	182	140	7		
493		5680		0	320			410		42	31		0	55			1180		45		
494	0	4900	70100	0	868			470	900	134			0	155			2115	837	88	99	
495		25800	123200	0	280			375		110	43		0	450			1600		292		
496		30200		0	205			323		85			0	310			1490		139		
497		5100		0	650			1380		380	47		0	505			419		200	25	
498		39500		0	2293			6220		1340			0	600			1600		340		
499		2405		0	291			2088					0	50	0	50	171				
500		36500		0	778			3450		460			0	300			1300		170		
501		68000		0	451			2650	15290	360			0	229			828		229	514	
502	0	480	7750	0	6	0	6	201		3			0	0	0	0	44		0		
503	0	48500	23500	0	490			3890		31			0	50			1050		50		
504		4795		0	198			215		35	14		0	15			82		15	67	
505		198000	702000	0	1979			11265	30366	1285			0	900			4800		520		
506	0	720	2580	0	34			730	139	14	11		0	0	0	0	44		0	9	
507	0	490	12410	0	55			718	3288	34	9		0	103			103		41	16	
508		320		0	0	0	0	205		0	6		0	12			78		4	2	
509		785		0	34			308		27	9		0	24			158		18	6	
510		690000		0	1428			10469		335			0	400			5320		380		
511		147400		0	4230			17990		1396			0	1200			3050		750		
512		126000		0	2035			15540		1060			0	700			5740		480		
513		145		0	73			420		31	6		0	12			78		4	11	
514		230		0	190			414		39	5		0	32			84		12	3	
515	0	150	3632	0	78			233	160	54			0	5			26	30	3		
516		36000		0	770			1786	800				0	105	105	0	584	120	84		
517	0	4836	0	0	46	0	46	278		6	0		0	14	14	0	53	0	14	53	0

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
471	0	1	1	0	0	4.2	2	0	0	1	0	1	0	0	0	0	-1	-1	FF	
472	0	1	0	0	1	6.6	1	0	0	1	0	1	0	0	0	0	0	0	FF	
473	0	1	1	0	1	6.6	1	1	0	1	0	1	0	0	0	0	-1	0	FF	
474	0	0	1	0	1	2	2	0	0	1	0	0	0	0	0	0	-1	-1	FF	
475	0	0	1	0	1	21.6	1	0	1	1	0	0	0	0	0	0	-1	-1	FF	
476	0	0	0	0	0	1	1	0	-1	1	0	0	0	0	0	0	0	0	RC	FF
477	0	0	0	0	1	5	2	0	0	1	0	0	0	0	0	0	0	0	FF	
478	0	0	0	0	1	3.9	2	0	0	1	0	0	0	0	0	0	-1	0	FF	
479	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	-1	0	FF	
480	0	0	1	0	1	2.6	1	1	-1	1	1	0	0	0	0	0	-1	0	FF	EE
481	0	0	1	0	1	5.6	1	0	0	1	0	0	0	0	0	0	-1	-1	FF	
482	0	0	1	0	0	1.4	2	0	0	0	0	0	0	0	0	0	-1	0	FF	
483	0	0	0	0	1	6.4	1	0	-1	-1	0	0	0	1	0	0	0	0	RC	FF
484	0	0	0	0	1	30	2	0	1	0	0	1	0	0	1	-1	0	0	FF	
485	0	0	0	0	1	15	2	0	0	0	0	0	0	0	0	0	0	0	FF	EE
486	1	0	1	0	1	10	1	1	1	1	2	0	1	1	1	0	0	0	RC	
487	1	0	1	0	1	11	1	1	0	1	1	0	1	1	1	0	-1	0	FF	
488	2	2	1	2	2	120	1	2	2	1	1	0	1	2	1	0	0	0	FF	RC
489	2	2	1	2	2	357.5	2	1	-2	1	1	-1	1	0	0	-1	-1	-1	FF	EE
490	0	2	0	0	1	143	1	1	2	1	0	0	0	1	0	1	-1	-1	FF	DE
491	-1	0	0	0	0	54.4	2	-1	0	0	0	1	1	1	1	0	-1	-1	FF	EE
492	0	1	0	0	2	7	1	0	2	1	0	1	1	0	1	1	-1	0	FF	
493	1	0	0	0	1	12.9	2	1	-2	1	1	0	0	0	1	-1	-1	-1	FF	
494	1	0	0	0	1	8	1	1	-1	1	0	0	0	0	1	0	-1	-1	FF	
495	1	-1	0	0	1	22.8	2	1	-2	0	0	0	0	0	1	-1	-1	-1	FF	
496	1	-1	0	0	0	3	1	1	-2	0	0	-2	0	0	0	-1	-1	-1	FF	
497	-1	1	0	0	0	0	2	0	2	0	1	0	0	0	0	1	0	0	FF	
498	-2	2	1	0	2	147	1	0	2	0	1	1	1	0	1	1	-1	0	FF	DE
499	-1	1	1	0	1	25.5	1	0	2	1	0	1	1	0	1	0	-1	-1	FF	
500	-1	1	1	0	0	319.8	1	0	2	0	1	0	1	0	1	1	-1	-1	FF	RC
501	-1	1	1	0	0	145	1	0	0	1	0	1	1	0	1	1	-1	1	DE	
502	2	2	1	0	1	6	1	1	2	1	1	1	1	0	1	1	-1	-1	FF	RC
503	2	2	1	0	2	17.5	1	1	2	1	1	1	1	0	0	1	-1	-1	FF	DE
504	0	0	1	0	1	160	1	0	1	1	1	0	1	0	0	0	-1	0	FF	DE
505	0	2	1	0	2	319.8	1	1	2	1	1	0	1	1	1	1	-1	0	FF	EE
506	0	0	1	0	1	8	2	0	1	1	1	1	1	0	1	0	-1	-1	FF	
507	0	0	1	0	1	7	2	0	1	-1	1	0	-1	0	1	0	-1	-1	FF	
508	0	0	1	0	1	3.9	1	0	1	0	1	0	0	0	0	0	-1	-1	RC	FF
509	0	0	1	0	1	2.4	2	0	1	0	1	0	0	0	0	0	-1	0	FF	
510	2	2	1	2	2	325	1	1	2	1	1	1	1	1	1	1	-1	0	DE	
511	2	2	1	2	2	483	1	1	2	1	1	1	1	0	1	1	-1	0	FF	DE
512	2	2	1	2	2	125.4	1	0	2	1	1	0	1	0	1	1	-1	-1	FF	DE
513	0	0	1	0	0	4	2	0	1	1	0	0	0	0	0	0	-1	-1	FF	
514	0	0	1	0	1	4	2	0	1	1	0	1	1	0	0	0	-1	-1	FF	
515	2	2	1	2	2	3	1	1	2	1	1	1	1	0	1	0	-1	0	FF	
516	1	0	0	1	1	160	1	1	2	1	1	0	1	1	1	0	-1	0	RC	
517	0	1	1	0	1	1	1	0	0	1	1	0	1	0	1	1	-1	0	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
471					DO	FF					1	1944	11	10		1944	11	11	
472					DD						1	1944	11	13		1944	11	15	
473					DO						1	1944	11	13		1944	11	16	
474					DD						2	1944	11	14	845	1944	11	14	1730
475					DO						1	1944	11	20		1944	11	27	
476					DO	FF					1	1944	11	24		1944	11	25	
477											1	1944	11	26	1045	1944	11	26	1730
478					DD						1	1944	11	27		1944	11	29	
479					DO	FF					1	1944	11	28		1944	11	29	
480	LF				DO	FF					1	1944	12	1		1944	12	2	
481					DD						1	1944	12	6		1944	12	7	
482		FF			DD						1	1944	12	6	830	1944	12	6	2000
483	EE				DD						1	1944	12	16		1944	12	17	
484					DD						1	1944	12	17		1944	12	22	
485	LF				DD						1	1944	12	18		1944	12	20	
486		RC			DO	FF					1	1940	5	13		1940	5	14	
487					DD						2	1941	12	12	300	1941	12	12	500
488		EE	RF		DO	DE					1	1941	6	22		1941	6	26	
489	DE	FF	EE		DO	FF					1	1941	9	30		1941	12	3	
490					DD						1	1941	12	5		1942	1	7	
491	RC	FE	LF		DO						8	1942	8	4	745	1942	8	4	1800
492		FE	LF		DO	FF					1	1943	1	12		1943	1	18	
493		LF	RF		DD						1	1943	7	4		1943	7	6	
494					DO	FF					1	1943	7	5		1943	7	5	
495		EE	LF		DO	FF					1	1943	7	7		1943	7	10	
496					DO	FF					1	1943	7	11		1943	7	15	
497					DO	FF					1	1943	7	12		1943	7	13	
498		EE	LF		DO						1	1943	8	3		1943	8	23	
499		EE	LF		DD						1	1943	8	3		1943	8	5	
500	EE	EE	RF		DO	FF					1	1943	9	26		1943	11	5	
501					DO						1	1944	1	24		1944	2	17	
502		EE	LF		DD						1	1944	1	31		1944	2	5	
503		EE	LF		DD						1	1944	5	5		1944	5	9	
504					DD						1	1944	6	25		1944	6	29	
505	RF	EE	LF		DO	FF					1	1944	7	13		1944	7	29	
506					DO	FF					1	1944	7	14	515	1944	7	14	2200
507					DO	FF					1	1944	7	15	400	1944	7	15	2200
508					DO	FF	DE				1	1044	7	29		1944	7	31	
509					DO	FF	DE				1	1944	8	2		1944	8	7	
510		FF			DO	FF					1	1944	8	20		1944	8	29	
511		EE	RF		DO	FF					1	1945	1	12		1945	2	3	
512		EE	RF		DO						1	1945	1	13		1945	1	31	
513					DO	FF					1	1945	1	14		1945	1	14	
514					DO	FF					1	1945	1	15		1945	1	15	
515					DD						1	1945	4	16		1945	4	17	
516		EE	LF		DD						1	1945	8	9		1945	8	16	
517					DO	FF					4	1943	11	20	910	1943	11	20	1900

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
471	R	M	0				W	H	C	T									0
472	R	M	0				W	L	C	T									0
473	R	M	0				W	L	C	T									0
474	R	M	0				W	L	C	T									0
475	R	M	0				D	O	C	T									0
476	R	M	0				D	O	C	T									0
477	R	M	0				D	O	C	T									0
478	R	M	0				W	L	C	T									0
479	R	M	0				W	L	C	T									0
480	R	M	0				D	O	T	T									0
481	R	M	0				D	O	T	T									0
482	R	M	0				W	L	C	T									0
483	G	M	0	R	M		W	H	C	T									0
484	R	M	0	G	M		W	L	C	T									0
485	R	M	0				W	L	C	T									0
486	R	M	0				D	S	T	T									1
487	R	W	0				W	H	H	E									1
488	R	M	0	F	M		D	S	T	T									2
489	R	M	0				D	S	C	T	W	L	C	T	W	H	C	T	2
490	R	M	0				D	S	C	T	W	L	C	T	W	H	C	T	0
491	F	W	0	F	M		D	S	T	T	W	L	T	T	W	H	T	T	-1
492	F	M	0				W	L	C	T									1
493	R	M	0				D	S	T	T	W	L	T	T					1
494	R	M	0				W	L	T	T									0
495	R	M	0				D	S	T	T	W	L	T	T					1
496	R	M	0				D	O	T	T	W	L	T	T					1
497	R	M	0				D	S	T	T									0
498	R	M	0				D	S	T	T	W	L	T	T					1
499	R	M	0				D	S	T	T									0
500	R	M	0				D	S	T	T	D	O	T	T	W	L	T	T	0
501	F	M	0				W	H	C	T	W	O	C	T					0
502	F	M	0				W	L	C	T	W	H	C	T					0
503	R	M	0			U	D	S	T	T									2
504	F	W	M				D	S	T	T									0
505	F	M	0	R	M		D	S	T	T	W	L	T	T					-1
506	F	W	0				D	S	T	T									0
507	F	W	0				D	S	T	T									0
508	F	M	0				D	S	T	T									0
509	F	M	0				D	S	T	T									0
510	F	M	0				D	S	T	T									2
511	F	M	0	R	M		D	S	C	T	W	L	C	T					2
512	R	M	0			M	W	L	C	T	W	H	C	T					0
513	R	0	0				W	L	C	T									0
514	R	0	0				W	L	C	T									0
515	G	M	0				D	S	T	T									2
516	R	M	0	G	M		W	L	T	T	W	H	T	T					0
517	R	M	0				D	S	T	T									0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
471	0	0	0	-1	-1	0	1
472	0	0	0	-1	-1	0	1
473	0	0	0	-1	-1	0	1
474	0	0	0	-1	-1	0	1
475	0	0	0	-1	-1	0	1
476	0	0	0	0	-1	0	1
477	0	0	0	0	-1	0	1
478	0	0	0	0	-1	0	1
479	0	0	0	-1	-1	0	0
480	0	0	0	0	-1	0	1
481	0	0	0	0	-1	0	1
482	0	0	0	-1	-1	0	0
483	0	0	0	0	-1	0	1
484	0	0	0	0	-1	0	0
485	0	0	0	0	-1	0	-1
486	1	1	0	0	-1	1	1
487	2	1	0	-1	-1	1	1
488	2	2	2	1	1	2	1
489	2	0	2	-2	0	2	-1
490	-1	2	2	2	0	0	1
491	-1	0	0	0	-1	0	1
492	1	2	0	1	1	0	1
493	0	0	-1	0	0	0	1
494	0	0	-1	0	-1	0	1
495	1	0	-1	0	0	1	1
496	1	-1	-1	0	0	0	-1
497	-1	1	1	0	0	0	1
498	0	2	2	0	0	0	1
499	-1	1	1	0	0	0	1
500	-1	-1	1	0	0	0	1
501	0	1	1	0	0	0	1
502	0	2	2	0	-1	0	1
503	2	2	2	0	0	0	1
504	0	1	0	0	0	0	1
505	0	2	2	0	0	0	1
506	0	1	0	0	0	0	1
507	0	1	0	0	-1	0	1
508	0	1	0	0	0	0	1
509	0	1	0	0	-1	0	-1
510	2	2	2	0	0	0	1
511	2	2	2	0	0	0	1
512	2	2	0	0	0	0	1
513	0	1	0	0	0	0	0
514	0	1	0	0	0	0	1
515	2	2	0	-1	-1	0	1
516	0	1	1	-1	-1	0	1
517	0	0	0	0	0	0	1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
518	4.70	4.70	0	FD		0	0	0	0	1	33915	1	33915		6845		18300	1	18300
519	0.80	0.80	0	FD		0	0	0	0	1	3200	1	3200		510		1600	3	1600
520	1.80	1.80	0	FD		0	0	0	0	1	32000	1	32000		3885		2685	3	2685
521	1.60	1.60	0	DL		0	0	0	0	1	22888	1	22888		158		1400	1	1400
522	2.20	2.20	0	FD		0	0	0	0	1	18398	1	18398		286		2900	1	2900
523	2.60	2.60	0	FD		0	0	0	0	1	18111	1	18111		466		4731	1	4731
524	3.40	3.40	0	FD		0	0	0	0	1	16291	1	16291		740		2600	1	2600
525	3.00	3.00	0	FD		0	0	0	0	1	14594	1	14594		269		5000	1	5000
526	3.00	3.00	0	FD		0	0	0	0	1	15986	1	15986		182		4500	1	4500
527	3.00	3.00	0	FD		0	0	0	0	1	15764	1	15764		398		4050	1	4050
528	1.80	1.80	0	HD		0	0	0	0	-1	6850	1	6850		3704		15350	1	15350
529	2.20	2.20	0	FD		0	0	0	0	1	15109	1	15109		114		5140	1	5140
530	3.60	3.60	0	PD		0	0	0	3	1	16043	1	16043		170		3338	1	3338
531	3.60	3.60	0	HD		0	0	0	2	-1	4000	1	4000	0	1269	2731	15777	1	15777
532	4.00	4.00	1	FD	DL	1	0	0	0	1	15840	1	15840		124		3000	1	3000
533	4.00	4.00	1	FD	DL	1	0	0	0	1	15205	1	15205		182		2600	1	2600
534	2.50	2.50	0	FD		0	0	0	0	1	16091	1	16091		193		3500	1	3500
535	2.00	2.00	0	FD		0	0	0	0	1	16002	1	16002		248		2500	1	2500
536	1.50	1.50	0	FD		0	0	0	0	1	5237	1	5237		48		2500	1	2500
537	3.00	3.00	0	FD		0	0	0	0	1	15808	1	15808		317		2000	1	2000
538	5.00	5.00	0	DL		0	0	0	0	1	19082	1	19082		282		2000	1	2000
539	4.00	4.00	0	FD		0	0	0	0	1	18388	1	18388		555		2900	1	2900
540	3.80	3.80	0	FD		0	0	0	0	1	21247	1	21247		1079		3000	1	3000
541	2.30	2.30	0	FD		0	0	0	0	1	17163	1	17163		879		3000	1	3000
542	2.10	2.10	0	FD		0	0	0	0	1	18095	1	18095		479		3900	1	3900
543	2.30	2.30	0	FD		0	0	0	0	1	19714	1	19714		502		5284	1	5284
544	2.50	2.50	0	FD		0	0	0	0	1	20973	1	20973		590		4757	1	4757
545	2.90	2.90	0	FD		0	0	0	0	1	19658	1	19658		313		4227	1	4227
546	3.00	3.00	2	PD	FD	0	0	0	0	1	18777	1	18777		112		4000	1	4000
547	3.00	3.00	2	PD	FD	0	0	0	0	1	18660	1	18660		88		4250	1	4250
548	3.00	3.00	2	PD	FD	0	0	0	0	1	19047	1	19047		576		3250	1	3250
549	2.00	2.00	0	PD		0	0	0	2	1	10900	1	10900	0	225	10675	6160	1	6160
550	11.00	11.00	0	FD		0	0	0	2	1	27682	3			1750	25932	13600	1	13600
551	1.00	4.50	0	HD		0	0	0	1	1	12800	3			375	12425	9900	3	
552	1.00	4.50	2	HD	PD	0	0	0	1	1	5350	1	5350	0	250	5100	5450	1	5450
553	3.00	1.00	1	HD	PD	0	0	1	1	1	10700	1	10700	0	375	10325	8640	3	
554	24.00	24.00	2	PD	FD	0	0	0	2	1	19520	1	19520	0	700	18820	19500	1	19500
555	10.00	10.00	2	HD	PD	0	0	0	1	1	10450	3			90	10360	10050	1	10050
556	8.00	8.00	0	FD		0	0	0	2	0	19280	1	19280	0	300	18980	18450	1	18450
557	7.00	7.00	2	PD	FD	0	0	0	0	1	6912	1	6912	0	135	6777	12750	1	12750
558	10.00	10.00	1	PD	DL	1	0	1	0	1	10800	1	10800	0	70	10730	3000	1	3000
559	9.00	9.00	1	PD	FD	1	1	0	1	1	12150	1	12150	0	55	12095	17450	1	17450
560	7.00	7.00	1	PD	DL	1	0	1	0	1	8700	3			60	8640	3000	3	
561	1.00	1.00	0	HD		0	0	0	0	-1	22000	1	22000	0	550	21450	7250	3	
562	10.00	10.00	0	DL		0	0	0	0	1	10200	3			75	10125	13500	3	
563	12.00	12.00	0	HD		0	0	0	2	1	18780	1	18780	0	60	18720	18450	1	18450
564	5.00	5.00	0	HD		0	0	0	0	0	3500	1	3500	0	450	3050	3600	3	

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
518		15615		0	144	0	144	474	300	11	0	26	0	40	10	30	59	10	40	54	10
519	0	1231	369	0	23	0	23	330	40	0	0	0	0	0	0	0	30	10	0	30	0
520	0	2685	0	0	144	0	144	804	175	0	0	0	0	40	10	30	120	0	40	120	0
521		628		0	134	73	61	95	395	0			0	0	0	0	0	0	0	0	0
522		2120		0	134	73	61	173	158	5			0	0	0	0	32	0	0		0
523		1278		0	151	73	78	221	123	5			0	0	0	0	32	0	0		0
524		1661		0	125	56	69	221	526	18			0	0	0	0	38	0	0		0
525		1324		0	126	56	70	203	125	3			0	0	0	0	40	0	0		0
526		814		0	123	56	67	226	129	11			0	0	0	0	40	0	0		0
527		2276		0	126	70	56	329	269	4			0	0	0	0	40	0	0		0
528		339		0	0	0	0	60		0	25		0	140	73	67	198	175	0		
529		1464		0	140	73	67	209	173	0			0	0	0	0	30	0	0		0
530		478		0	0	0	0	50	21	0			0	0	0	0	2	0	0		0
531	0	241	15536	0	0	0	0	8	0	0		0	0	0	0	0	157	43	0		
532		434		0	0	0	0	171	0	0		0	0	0	0	0	24	0	0		0
533		2564		0	79	17	62	150	47	0			0	0	0	0	3	0	0		0
534		1222		0	122	44	78	129	98	0			0	0	0	0	12	0	0		0
535		1470		0	122	44	78	180	53	0			0	0	0	0	12	0	0		0
536		2401		0	40	14	26	53	0	0			0	0	0	0	6	0	0		0
537		1971		0	109	39	70	141	27	0			0	0	0	0	6	0	0		0
538		1588		0	138	77	61	95	395	5			0	0	0	0	0	0	0	0	0
539		2470		0	74	18	56	174	315	9			0	0	0	0	32	0	0		0
540		2468		0	0	0	0	246	166	0			0	0	0	0	32	0	0		0
541		2860		0	100	26	74	228	637	11			0	0	0	0	34	0	0		0
542		3810		0	97	31	66	200	225	10			0	0	0	0	36	0	0		0
543		4038		0	121	45	76	157	162	6			0	0	0	0	34	0	0		0
544		4328		0	129	59	70	210	240	4			0	0	0	0	34	0	0		0
545		3022		0	140	73	67	183	45	3			0	0	0	0	34	0	0		0
546		798		0	113	46	67	177	151	0			0	0	0	0	21	0	0		0
547		1006		0	117	50	67	172	0	2		0	0	0	0	0	11	0	0		0
548		3200		0	115	50	65	206	76	4			0	0	0	0	5	0	0		0
549	0	200	5960	0	100	0	100	36	12	18			0	40	0	40	20	0	15		0
550	0	1500	12100	0	91	18	73	72	11	40			0	40	0	40	36	4	35		
551		350	9550	0	140	0	140	48	21	18			0	120	0	120	24	0			0
552	0	250	5200	0	90	0	90	24	21	18			0	60	0	60	24	0	25		0
553		350	8290	0	180	0	180	48	52	18			0	84	0	84	24	0	35		0
554	0	2700	16800	0	240	105	135	84	38	15			0	197	13	184	68	51	70		
555	0	1350	8700	0	180	60	120	48	76	11			0	180	20	160	48	20	30		
556	0	900	17550	0	120	30	90	72	0	19		0	0	114	10	104	126	0	40		0
557	0	225	12525	0	90	0	90	48	38	13			0	78	5	73	36	0	40	36	
558	0	450	2550	0	184	20	164	48	52	10	0		0	60	0	60	48	0	32		0
559	0	626	16824	0	100	10	90	72	38	8			0	134	10	124	114	10	90	114	
560		550	2450	0	146	0	146	48	40	10			0	40	10	30	24	0	30		0
561		90	7160	0	224	20	204	114	0	100		0	0	90	0	90	48	20	16		
562		550	12950	0	220	85	135	72	40	5			0	172	15	157	48	0	30		0
563	0	625	17825	0	120	0	120	72	122	4			0	114	10	104	72	0	60	72	0
564		60	3540	0	60	0	60	0	0	20	0	0	0	70	40	30	0	0	3	0	

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
518	0	1	1	0	1	6	1	1	1	1	1	0	0	0	0	1	-1	0	FF	
519	0	1	1	0	1	1	1	0	1	1	1	0	1	0	0	1	-1	0	FF	
520	1	1	1	0	0	1.2	1	0	1	1	1	1	1	0	0	0	-1	0	FF	
521	1	0	0	0	1	10.2	1	1	0	1	1	1	1	0	0	1	0	0	FF	
522	0	0	0	0	0	3.2	1	1	0	1	0	1	0	0	0	0	-1	0	FF	EE
523	0	0	0	0	0	0.3	2	0	0	0	0	0	0	0	0	0	0	0	FF	EE
524	0	0	0	0	0	1.5	1	1	0	1	1	1	0	0	0	0	-1	-1	FF	
525	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	-1	-1	DE	
526	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	-1	-1	EE	LF
527	0	0	-1	0	0	0 4	1	0	0	0	1	0	0	0	0	0	-1	-1	DE	
528	0	0	0	-1	1	0	1	-1	0	-1	-1	-1	0	0	0	0	0	0	FF	EE
529	0	0	0	0	0	1.4	1	1	0	1	1	0	0	0	0	0	-1	-1	FF	
530	0	0	0	0	0	1	1	0	0	0	1	1	0	1	0	0	-1	-1	EE	RF
531	0	0	0	-1	0	0	2	0	0	0	-1	-1	0	0	0	0	0	0	FF	EE
532	0	0	0	0	0	1	2	0	0	0	1	1	0	0	0	0	-1	-1	FF	
533	1	0	0	0	0	0.8	2	1	0	1	1	1	0	0	0	0	-1	-1	FF	
534	1	0	0	0	0	1.5	2	1	0	0	1	1	0	0	0	0	-1	-1	FF	
535	1	0	0	0	1	0 9	1	1	0	1	1	1	0	0	0	0	-1	-1	FF	
536	1	0	0	0	1	0.3	1	1	0	1	1	0	0	0	0	0	-1	-1	FF	
537	1	0	0	0	1	0.9	1	1	1	1	1	1	0	0	0	0	-1	0	FF	
538	1	0	0	0	1	6.6	1	1	0	1	1	1	1	0	0	0	0	0	FF	
539	0	0	0	0	0	1.6	2	1	0	1	1	1	0	0	0	0	-1	-1	FF	
540	0	0	0	0	0	0.4	1	0	0	0	0	1	0	0	0	0	-1	-1	FF	DE
541	0	0	1	1	1	1.5	1	1	0	1	1	1	0	0	0	0	-1	-1	FF	DE
542	0	-1	0	1	1	1.6	2	1	-1	1	1	1	0	0	0	-1	-1	-1	FF	
543	0	0	0	1	1	0.9	2	0	0	1	1	1	0	0	0	0	-1	-1	FF	
544	0	0	0	1	1	0.5	2	0	0	1	1	1	0	0	0	0	-1	-1	FF	
545	0	0	0	1	1	1	1	1	0	1	1	1	0	0	0	0	-1	0	EE	RF
546	1	-1	0	1	1	2	1	1	0	1	1	1	0	0	0	-1	1	0	FF	
547	1	0	1	1	1	0.6	2	1	0	1	1	1	0	0	0	0	-1	0	FF	
548	1	1	1	1	1	1.8	1	1	1	1	1	1	0	0	0	0	-1	0	FF	
549	1	0	0	0	0	5	1	1	0	1	1	0	1	1	1	0	-1	0	FF	DE
550	1	0	0	0	1	21	1	1	0	1	2	0	1	1	1	0	-1	0	DE	
551	1	0	0	0	0	16	1	1	0	0	2	0	0	1	1	0	0	0	FF	
552	1	0	0	0	1	8	1	1	0	1	1	0	0	1	1	0	0	0	FF	EE
553	1	0	1	0	1	10	1	1	0	1	1	0	0	1	1	0	0	0	FF	EE
554	1	0	0	0	1	10	1	1	0	0	2	0	1	1	1	0	-1	-1	DE	
555	1	0	1	0	1	14.5	1	1	1	0	2	0	1	1	1	0	0	0	FF	EE
556	1	0	0	0	1	20	1	2	0	0	0	0	2	1	1	0	-1	-1	EE	LR
557	1	0	1	0	1	8	1	1	0	0	1	0	0	0	1	0	-1	0	FF	
558	1	0	1	0	1	5	2	1	0	0	1	0	0	0	1	0	-1	0	FF	
559	1	0	0	0	1	16	1	2	0	0	1	0	1	1	1	0	-1	0	FF	
560	1	0	1	0	1	28	1	1	0	2	1	0	1	0	1	0	0	-1	FF	EE
561	-1	0	0	0	-1	0	1	-1	0	0	-2	0	0	0	0	0	0	0	FF	
562	1	0	1	0	1	25	1	1	0	0	1	0	0	0	1	0	0	0	EE	LR
563	1	0	1	0	1	15	1	1	0	0	1	0	0	1	1	0	0	0	DE	
564	-1	0	0	0	0	0	1	-1	-2	0	0	0	0	0	-1	0	0	0	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
518					DO	FF					1	1945	2	20		1945	2	24	
519					DD						1	1945	2	20		1945	2	24	
520					DD						1	1945	3	11		1945	3	16	
521					DD						1	1945	4	2		1945	4	4	
522	LF				DD						1	1945	4	5		1945	4	8	
523	RF				DO						1	1945	4	9		1945	4	11	
524					DO						1	1945	4	19		1945	4	23	
525					DD						1	1945	4	25		1945	4	27	
526		EE	RF		DD						1	1945	4	28		1945	4	29	
527					DO						1	1945	4	30		1945	5	3	
528	LF				DD						1	1945	5	4		1945	5	5	
529					DD						1	1945	5	6		1945	5	7	
530					DD						1	1945	5	22		1945	5	23	
531	RF	FF			DD						1	1945	5	24		1945	5	25	
532		FF			DD						1	1945	5	26		1945	5	27	
533		FF			DD						1	1945	5	29		1945	5	31	
534					DD						1	1945	6	6		1945	6	8	
535					DD						1	1945	6	9		1945	6	11	
536					DD						1	1945	6	12		1945	6	12	
537					DD						1	1945	6	15		1945	6	17	
538					DD						1	1945	4	2		1945	4	4	
539					DD						1	1945	4	5		1945	4	8	
540		FF			DO	FF					1	1945	4	9		1945	4	12	
541					DD						1	1945	4	19		1945	4	23	
542		FF			DO	FF					1	1945	4	26		1945	4	29	
543		FF			DO	FF					1	1945	5	11		1945	5	13	
544		FF			DD						1	1945	5	14		1945	5	18	
545		FF			DD						1	1945	5	20		1945	5	21	
546					DD						1	1945	6	6		1945	6	9	
547					DD						1	1945	6	10		1945	6	11	
548					DD						1	1945	6	12		1945	6	17	
549					DO	DE					2	1967	6	5	1500	1967	6	5	2400
550					DO	FF					4	1967	6	5	1600	1967	6	5	2300
551		EE	RR		DD						2	1967	6	6	600	1967	6	6	2000
552	RR				DD						2	1967	6	6	1015	1967	6	6	2000
553	RR				DD						1	1967	6	7	1230	1967	6	7	1830
554		FE			DO	EE	LR				2	1967	6	5	815	1967	6	5	1500
555	RR				DO	FF					1	1967	6	5	2100	1967	6	6	1030
556		EE	RR	FE	DO						1	1967	6	5	2000	1967	6	6	500
557					DD						1	1967	6	5	2000	1967	6	6	700
558					DD						1	1967	6	6	1900	1967	6	6	2230
559					DD						3	1967	6	5	815	1967	6	5	2030
560	LR				DD						2	1967	6	7	515	1967	6	7	1100
561					DO	EE	RR				1	1967	6	7	1800	1967	6	8	430
562					DD						1	1967	6	7	1700	1967	6	7	2000
563					DD						1	1967	6	8	1000	1967	6	8	1430
564					DO	DE					1	1967	6	8	30	1967	6	8	330

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
518	R	B	0	G	B		D	S	T	T									0
519	G	B	0				D	S	T	T									0
520	R	B	0				D	S	T	T									0
521	F	M	0	R	M		D	S	T	T									0
522	G	M	0	F	B		D	O	T	T	W	L	T	T					0
523	G	M	0	F	B		W	H	T	T									0
524	G	M	0	R	M		D	S	T	T	D	O	T	T					0
525	G	M	0	R	M		W	L	T	T									0
526	G	M	0	R	M		D	S	T	T									0
527	G	M	0	R	M		D	S	T	T	W	H	T	T					0
528	G	M	0	R	M		D	S	T	T									0
529	G	M	0	R	M		D	S	T	T	W	L	T	T					0
530	G	M	0	R	M		W	H	T	T									0
531	R	M	0				W	L	T	T	W	H	T	T					0
532	G	M	0				W	H	T	T									0
533	G	M	0	R	M		W	H	T	T									0
534	G	M	0				D	S	T	T									0
535	G	M	0				D	S	T	T									0
536	G	M	0				D	S	T	T									0
537	G	M	0				D	S	T	T									0
538	R	M	0	G	M		D	S	T	T									0
539	R	M	0	G	M		D	O	T	T									0
540	R	M	0	G	M		W	H	T	T									0
541	R	M	0	G	M		D	S	T	T	D	O	T	T					0
542	R	M	0	G	M		W	H	T	T	D	S	T	T					0
543	R	M	0	G	M		D	S	T	T									0
544	R	M	0	G	M		D	S	T	T									0
545	R	M	0	G	M		W	L	T	T									0
546	R	M	0	G	M		D	S	T	T									0
547	R	M	0	G	M		D	O	T	T									0
548	G	M	0				D	S	T	T									0
549	G	M	0				D	S	H	T									1
550	G	M	0				D	S	H	T									1
551	G	M	0				D	S	H	T									1
552	G	M	0				D	S	H	T									1
553	G	M	0				D	S	H	T									0
554	F	M	0	F	D		D	S	H	T	D	S	H	D					1
555	F	D	0	R	D		D	S	H	T	D	S	H	D					1
556	F	D	0	R	D		D	S	H	T	D	S	H	D					1
557	F	M	0	F	D		D	S	H	T	D	S	H	D					1
558	F	D	0	R	D		D	S	H	T	D	S	H	D					1
559	F	M	0	F	D		D	S	H	T	D	S	H	D					1
560	F	D	0	R	D		D	S	H	T	D	S	H	D					1
561	F	D	0	F	M		D	S	H	T	D	S	H	D					-1
562	F	D	0	F	M		D	S	H	T	D	S	H	D					1
563	F	D	0	R	D		D	S	H	T	D	S	H	D					1
564	F	D	0	F	M		D	S	H	T	D	S	H	D					-1

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
518	0	0	0	0	0	0	1
519	0	0	0	0	0	0	1
520	0	0	0	0	0	0	1
521	1	1	0	0	0	0	1
522	0	0	0	0	-1	0	1
523	0	0	0	0	0	0	1
524	0	1	0	0	-1	0	1
525	0	0	-1	-1	-1	0	-1
526	0	0	0	0	-1	0	-1
527	0	0	0	-1	-1	0	-1
528	0	0	0	0	0	0	-1
529	0	0	0	0	-1	0	1
530	0	1	0	-1	-1	0	1
531	0	0	0	0	0	0	-1
532	0	1	0	-1	-1	0	-1
533	0	1	0	-1	-1	0	1
534	0	1	0	0	-1	0	0
535	0	1	0	0	-1	0	1
536	0	1	0	0	-1	0	1
537	0	1	0	0	-1	0	1
538	1	0	0	0	-1	0	1
539	0	0	0	0	-1	0	1
540	0	0	0	-1	-1	0	-1
541	0	0	0	0	-1	0	1
542	0	0	0	-1	-1	0	1
543	0	0	0	0	-1	0	0
544	0	0	0	0	-1	0	0
545	0	1	0	0	-1	0	1
546	1	1	0	0	-1	0	1
547	1	1	0	0	-1	0	0
548	1	1	0	1	-1	0	1
549	1	0	0	0	0	1	1
550	1	0	0	0	0	1	1
551	1	0	0	0	0	1	1
552	1	0	0	0	0	1	1
553	1	1	0	0	0	1	1
554	1	0	0	0	0	1	1
555	1	0	0	0	0	1	1
556	1	0	1	0	0	1	1
557	1	1	0	0	0	1	1
558	1	1	0	0	0	1	0
559	1	0	0	0	0	1	1
560	1	1	0	0	0	1	1
561	-1	-1	0	0	0	-1	-1
562	1	1	0	0	0	1	1
563	1	1	0	0	0	1	1
564	-1	0	0	0	0	-1	-1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
565	6.50	6.50	0	FD		0	0	0	0	1	5375	1	5375	0	300	5075	8160	1	8160
566	5.00	5.00	0	FD		0	0	0	1	1	5350	1	5350	0	150	5200	4350	1	4350
567	1.00	1.00	0	FD		0	0	0	0	1	5850	1	5850	0	230	5620	8560	1	8560
568	5.00	5.00	0	PD		0	0	0	0	1	11940	1	11940	0	201	11739	16168	1	16168
569	110.00	110.00	1	PD	FD	1	0	0	3	0	29490	3			400	29090	4455	1	4455
570	38.00	38.00	1	PD	FD	1	0	0	3	0	22850	3			350	22500	3020	3	
571	110.00	110.00	2	HD	PD	0	0	0	1	0	63910	3			800	63110	14000	3	
572	54.00	38.00	2	HD	PD	0	0	0	1	0	45160	3			750	44410	10980	3	
573	27.00	27.00	0	HD		0	0	0	0	0	25850	1	25850	0	700	25150	67440	1	67440
574	50.00	50.00	2	HD	PD	0	0	0	0	-1	81160	1	81160	0	1700	79460	43400	1	43400
575	50.00	50.00	2	HD	PD	0	0	0	0	-1	57960	1	57960	0	1350	56610	28600	1	28600
576	14.00	14.00	2	HD	PD	0	0	0	2	0	22790	3			100	22690	30970	3	
577	11.00	11.00	2	HD	PD	0	0	0	0	0	28900	1	28900	0	950	27950	36840	3	
578	11.00	11.00	2	HD	PD	0	0	0	0	1	19600	1	19600	0	300	19300	18180	1	18180
579	20.00	20.00	2	HD	PD	0	0	0	0	1	17000	3			600	16400	23860	3	
580	18.00	18.00	2	HD	PD	0	0	0	0	1	16200	3			300	15900	35633	3	
581	32.00	32.00	0	HD		0	0	0	0	1	16200	1	16200	0	150	16050	25600	1	25600
582	32.00	32.00	0	HD		0	0	0	0	1	11700	1	11700	0	150	11550	22570	1	22570
583	6.00	6.00	2	HD	PD	0	0	0	0	1	14681	1	14681	0	340	14341	22570	1	22570
584	13.00	13.00	0	WD		0	0	0	0	1	10900	1	10900	0	75	10825	14620	1	14620
585	15.00	15.00	0	PD		0	0	0	2	0	17750	3			350	17400	3630	3	
586	7.50	7.50	2	FD	PD	0	0	0	2	0	22750	3			700	22050	5745	3	
587	14.00	14.00	2	FD	PD	0	0	0	2	0	19525	1	19525	0	350	19175	4958	1	4958
588	12.50	20.00	0	HD		0	0	0	2	-1	21984	3			500	21484	6300	3	
589	7.00	7.00	0	HD		0	0	0	2	-1	12500	1	12500	0	500	12000	6946	3	
590	14.00	14.00	0	HD		0	0	0	0	0	17833	3			450	17383	23750	3	
591	12.00	20.00	0	HD		0	0	0	0	1	12733	3			450	12283	14683	3	
592	7.50	7.50	2	FD	PD	0	0	0	0	-1	31650	3			1200	30450	5395	3	
593	1.00	1.00	0	FD		0	0	0	0	1	2692	1	2692	0	50	2642	1583	1	1583
594	5.00	5.00	0	FD		0	0	0	0	1	16100	3			525	15575	19400	3	
595	3.00	3.00	0	PD		0	0	0	0	1	14700	3			280	14420	21500	3	
596	12.00	20.00	0	HD		0	0	0	-2	-1	12500	1	12500	0	450	12050	14300	1	14300
597	20.00	20.00	0	HD		0	0	0	2	1	11000	1	11000	0	100	10900	12000	1	12000
598	9.00	9.00	0	PD		0	0	0	0	-1	11500	1	11500	0	450	11050	11000	1	11000
599	25.00	25.00	0	PD		0	0	0	0	-1	35750	1	35750	0	550	35200	16100	1	16100
600	1.00	1.00	0	FD		0	0	0	0	1	5,700	1	5,700	0	150	5,550	4,750	1	4,750
601	2.00	2.00	0	FD		0	0	0	0	1	11,400	1	11,400	0	100	11,300	4,750	1	4,750
602	22.00	22.00	0	HD		0	0	0	2	1	6,400	1	6,400	0	20	6,380	5,333	1	5,333
603	4.00	4.00	0	HD		0	0	0	0	-1	2,738	1	2,738	0	367	2,371	8,380	1	8,380
604	4.00	4.00	0	HD		0	0	0	0	1	7,000	1	7,000	0	200	6,800	5,303	1	5,303
605	1.00	1.00	0	FD		0	0	0	0	1	8,000	1	8,000	0	408	7,592	2,200	1	2,200
606	1.00	1.00	0	FD		0	0	0	0	1	7,600	1	7,600	0	666	6,934	2,200	1	2,200
607	1.00	1.00	0	FD		0	0	0	0	1	7,700	1	7,700	0	162	7,538	1,800	1	1,800
608	1.00	1.00	0	FD		0	0	0	0	1	7,538	1	7,538	0	575	6,963	1,800	1	1,800
609	2.00	2.00	9	PD	FD				2	-1	14,600	1	14,600	0	1,129	13,471	4,500	1	4,500
610	2.40	2.40	9	PD	FD				2	-1	15,736	1	15,736	0	613	15,123	5,050	1	5,050
611	2.60	2.60	9	PD	FD				2	-1	10,000	1	10,000	0	439	9,561	4,625	1	4,625

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
565	0	850	7310	0	10	0	10	24	119	5			0	75	0	75	70	0	20		0
566	0	300	4050	0	90	0	90	24	0	30		0	0	50	0	50	76	0	20		0
567	0	500	8060	0	90	30	60	24	119	55			0	75	0	75	62	0	25		0
568	0	497	15671	0	128	8	120	67	156	20	1	1	0	60	0	60	91	0	33	0	0
569	0	275	4180	0	67	50	17	1223	104	2			0	67	6	61	40	70	44		
570		225	2765	0	71	60	11	971	104	20			0	52	4	48	28	70	42		
571		450	13550	0	464	27	437	639	100	9			0	192	0	192	40	67	57		
572		400	10580	0	310	18	292	555	100	10			0	148	13	135	24	67	44		
573	0	700	66740	0	530	50	480	44	66	78			0	516	30	486	639	100	27		
574	0	380	43020	0	1002	70	932	585	44	120			0	714	70	644	144	72	31		
575	0	260	28340	0	709	50	659	447	44	140			0	348	40	308	96	72	17		
576		500	30470	0	344	30	314	96	0	58		0	0	389	30	359	322	0	62		0
577		2400	34440	0	444	40	404	72	267	40			0	419	0	419	347	164	222		
578	0	800	17380	0	232	20	212	72	153	15			0	293	23	270	119	80	64		
579		1800	22060	0	232	20	212	72	120	40			0	246	17	229	137	72	92		
580		1650	33983	0	318	30	288	48	240	30			0	454	60	394	213	150	114		
581	0	1100	24500	0	318	30	288	72	82	15			0	445	35	410	160	40	35		
582	0	1100	21470	0	126	10	116	48	154	8			0	259	18	241	139	57	68		
583	0	1100	21470	0	225	20	205	60	154	28			0	259	18	241	139	57	18		
584	0	400	14220	0	164	20	144	36	82	6			0	199	15	184	83	37	29		
585		200	3430	0	75	2	73	115	49	40			0	50	4	46	12	107	14		
586		250	5495	0	147	4	143	131	100	96			0	78	7	71	16	191	30		
587	0	250	4708	0	147	4	143	129	63	52			0	75	7	68	24	120	25		
588		150	6150	0	189	7	182	129	70	46			0	106	10	96	36	132	10		
589		250	6696	0	318	18	300	71	70	69			0	110	10	100	36	132	10		
590		1125	22625	0	249	30	219	60	250	30			0	253	11	242	161	111	117		
591		1125	13558	0	219	20	199	60	249	24			0	170	8	162	94	111	99		
592		400	4995	0	182	6	176	155	53	100			0	38	3	35	24	149	24		
593	0	100	1483	0	9	0	9	12	33	1			0	5	0	5	24	15	2		
594		1200	18200	0	270	30	240	60	330	30			0	329	18	311	110	120	126		
595		900	20600	0	318	30	288	60	220	20			0	387	20	367	130	80	88		
596	0	50	14250	0	318	18	300	71	40	103			0	318	30	288	60	28	4		
597	0	200	11800	0	212	20	192	40	30	6			0	269	15	254	70	20	34		
598	0	100	10900	0	269	9	260	48	50	57			0	212	20	192	48	50	8		
599	0	160	15940	0	566	22	544	198	50	67			0	270	30	240	60	50	10		
600	0	200	4,550	0	0	0	0	12	30	0			0	0	0	0	27	30	0		
601	0	250	4,500	0	0	0	0	24	60	0			0	0	0	0	27	30	0		
602	0	920	4,413	0	135	0	135	35	180	0	0		0	69	16	53	47	0	48	35	
603	0	50	8,330	0	66	0	66	26	0	48	4		0	135	0	135	35	125	10	0	
604	0	527	4,776	0	54	24	30	46	0	2			0	13	0	13	30	0	4	6	
605	0	13	2,187	0	50	0	50	105	0	0			0	14	0	14	42	0	0		
606	0	13	2,187	0	50	0	50	105	0	0			0	14	0	14	42	0	0		
607	0	13	1,787	0	15	0	15	122	0	0			0	14	0	14	42	0	0		
608	0	13	1,787	0	15	0	15	122	0	0			0	14	0	14	42	0	0		
609	0	442	4,058	0	40	0	40	100	100	22			0	37	0	37	70	267	21	0	
610	0	750	4,300	0	60	0	60	100	70	19			0	25	0	25	70	165	9	0	
611	0	199	4,426	0	20	0	20	100	100	0			0	7	0	7	70	267	0	0	

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
565	1	0	0	0	1	5	1	1	0	0	1	0	1	0	1	0	-1	-1	FF	
566	1	0	0	0	1	6	1	1	0	1	0	0	1	1	1	0	-1	0	FF	
567	1	0	0	0	1	7.5	1	1	0	0	1	0	1	0	1	0	-1	-1	FF	EE
568	1	0	0	0	1	0	2	1	-1	1	1	-1	0	0	1	0	-1	0	FF	DE
569	-1	0	0	0	0	5	1	-1	0	-1	0	2	2	2	0	0	-1	0	RC	FF
570	-1	0	0	0	0	5	1	-1	0	-1	0	2	2	2	0	0	-1	0	RC	FF
571	-2	0	1	0	0	3	1	-1	0	-1	0	2	1	1	0	0	-1	0	FF	
572	-2	0	1	0	0	3	1	-1	0	-1	0	2	1	1	0	0	-1	0	FF	
573	2	0	-1	0	0	0	1	1	0	1	0	-1	-1	0	-1	0	0	0	FF	
574	-1	0	0	0	0	0	1	-2	0	0	-1	0	-2	0	-1	0	0	0	FF	
575	-1	0	0	0	0	0	1	-2	0	0	-1	0	-2	0	-1	0	0	0	FF	
576	1	0	0	0	1	7	1	1	0	1	0	0	1	1	1	0	-1	0	EE	RR
577	1	0	0	0	0	10	1	1	0	1	0	0	0	0	1	0	-1	0	FF	DE
578	1	0	1	0	1	5	1	1	0	0	1	0	1	0	1	1	0	0	FF	
579	1	0	0	0	0	17.2	1	0	-2	0	1	0	0	0	0	0	-1	-1	FF	DE
580	1	0	1	0	1	120	1	2	0	2	1	0	0	0	1	0	0	0	FF	DE
581	1	0	1	0	1	10	1	1	0	1	1	0	0	0	1	0	0	0	FF	DE
582	1	0	1	0	1	20	1	2	1	0	1	0	0	0	1	1	0	0	FF	
583	1	0	1	0	1	44	1	1	0	0	1	0	0	0	1	0	-1	0	FF	
584	1	0	1	0	1	40	1	1	0	0	1	0	0	0	0	0	0	-1	EE	RR
585	-1	0	0	0	0	8	2	-1	0	0	0	0	0	1	0	0	-1	0	FF	EE
586	-1	0	0	0	0	1	1	-1	0	0	0	0	0	1	0	0	-1	0	FF	
587	-1	0	0	0	0	10	1	-1	0	1	0	2	0	1	0	0	-1	0	FF	EE
588	-1	0	0	0	0	0	1	-1	-2	0	-1	0	0	0	-1	0	0	-1	FF	
589	-1	0	1	0	1	0	1	-1	-1	0	-1	0	0	0	-1	0	0	-1	FF	
590	1	0	1	0	1	12	1	1	0	0	0	0	0	0	1	0	1	0	FF	EE
591	1	0	1	0	1	5.1	1	1	0	0	0	0	0	0	1	0	1	0	FF	
592	-1	0	0	0	1	0	1	-1	-1	0	0	0	0	0	0	0	-1	0	FF	
593	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
594	1	0	0	0	1	6	1	1	0	0	0	0	0	0	1	0	-1	0	FF	
595	1	0	0	0	1	4	1	1	0	0	0	0	0	0	1	0	-1	0	FF	
596	-2	0	0	0	-1	-2	1	-2	0	0	0	0	0	-2	-1	0	0	0	FF	
597	2	0	0	0	1	5	1	2	0	0	0	0	0	1	1	0	0	0	EE	RF
598	-1	0	0	0	0	0	1	-1	0	0	0	0	0	0	-1	0	0	0	FF	
599	-1	0	0	0	0	0	1	-2	0	0	0	0	0	0	-1	0	-1	0	FF	
600	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	FF	
601	1	0	0	0	1	5	1	1	0	0	0	0	1	0	1	0	-1	0	FF	EE
602	1	0	1	0	1	16		1	1	1	2	1	2	1	2	0	0	1	DE	
603	-1	0	-1	0	-1	0		-1	-1	0	-1	-1	-1	0	-1	0	0	-1	FF	
604	1	0	1	0	1	3		2	1	1	0	0	2	0	1	0	-1	1	FF	
605	0	1	0	0	-1	0.7		0	-2	0	0	1	-2	0	-1	0	-2	-1	FF	RC
606	0	0	0	0	-1	1		0	-2	0	0	1	-2	0	-1	0	-2	-1	FF	RC
607	0	0	0	0	-1	0.5		0	-2	0	0	1	-2	0	-1	0	-2	-1	FF	RC
608	0	0	0	0	-1	0.8		0	-2	0	0	1	-2	0	-1	0	-2	-1	FF	RC
609	0	0	1	0	1	0.75		0	0	0	-1	1	1	1	1	0	-1	-1	FF	
610	0	0	1	0	1	2		0	0	0	-1	1	1	1	1	0	-1	-1	FF	
611	0	0	1	0	1	0.2		0	0	0	-1	1	-1	1	1	0	-1	-1	FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
565					DD						1	1967	6	9	1130	1967	6	9	2400
566					DD						1	1567	6	9	2000	1967	6	9	2400
567	RF				DD						1	1967	6	9	1130	1967	6	9	2000
568		FE			DO	FF					1	1968	3	21	530	1968	3	21	2100
569					DO	FF					1	1973	10	6	1405	1973	10	7	15
570		EE	LR		DO	FF					1	1973	10	6	1405	1973	10	7	15
571		EE	RR		DO	FF					1	1973	10	7	30	1973	10	7	2300
572		EE	LF		DO	FF					1	1973	10	7	30	1973	10	7	2300
573		EE	RF		DO	EE	LF				1	1973	10	8	800	1973	10	8	1900
574					DO						1	1973	10	14	630	1973	10	14	1500
575					DD						1	1973	10	14	630	1973	10	14	1500
576		FF			DO	FF					1	1973	10	15	1700	1973	10	16	1200
577					DO	EE	LF				3	1973	10	16	1200	1973	10	16	1330
578		EE	LR		DO	FF					1	1973	10	18	545	1973	10	18	1900
579					DO	FF					4	1973	10	19	600	1973	10	19	1830
580					DO	FF					3	1973	10	19	630	1973	10	19	1830
581					DD						1	1973	10	22	500	1973	10	22	1850
582					DD						2	1973	10	23	630	1973	10	23	1930
583					DD						2	1973	10	23	1500	1973	10	23	1930
584					DD						1	1973	10	23		1973	10	24	
585	LF				DD						1	1973	10	6		1973	10	7	
586					DD						3	1973	10	6	1405	1973	10	7	500
587	RF				DO	FF					1	1973	10	6	1405	1973	10	7	1400
588					DO	FF					1	1973	10	7		1973	10	8	
589					DO	FF					2	1973	10	7	1315	1973	10	7	1830
590	LF				DO	FF					1	1973	10	8		1973	10	10	
591		DE			DO	FF					3	1973	10	8	600	1973	10	8	1830
592		EE	LF		DD						1	1973	10	8		1973	10	9	
593					DD						1	1973	10	8		1973	10	8	
594					DO	FF					3	1973	10	11	1100	1973	10	11	1600
595		EE	LR		DD						1	1973	10	11		1973	10	12	
596					DD						1	1973	10	13	300	1973	10	13	330
597					DD						1	1973	10	15	1600	1973	10	15	1900
598		EE	LR		DD						2	1973	10	16	500	1973	10	16	900
599					DD						1	1973	10	19	600	1973	10	19	1700
600					DD						1	1973	10	21	1400	1973	10	21	1600
601	RR				DD						1	1973	10	22		1973	10	22	
602					DO	FF					1	1943	2	14		1943	2	14	
603					DO	DE					1	1943	2	15		1943	2	15	
604		DE			DD						1	1943	2	19		1943	2	20	
605					DO	DE					1	1944	1	20		1944	1	20	
606					DO	DE					1	1944	1	21		1944	1	21	
607					DO	EE					1	1944	1	20		1944	1	20	
608					DO	EE					1	1944	1	21		1944	1	21	
609		EE	RF		DD						1	1944	2	16		1944	2	19	
610		EE	LF		DD						1	1944	2	16		1944	2	17	
611		EE	LF		DD						1	1944	2	16		1944	2	19	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
565	G	M	0				D	S	H	T									1
566	G	M	0				D	S	H	T									1
567	G	M	0				D	S	H	T									1
568	F	M	0				D	S	T	T									0
569	R	D	0				D	S	H	T	D	S	H	D					-1
570	R	D	0				D	S	H	T	D	S	H	D					-1
571	R	D	0				D	S	H	T	D	S	H	D					-2
572	R	D	0				D	S	H	T	D	S	H	D					-2
573	R	D	0				D	S	H	T	D	S	H	D					2
574	R	D	0				D	S	H	T	D	S	H	D					-1
575	R	D	0				D	S	H	T	D	S	H	D					-1
576	R	D	0				D	S	H	T	D	S	H	D					1
577	R	D	0				D	S	H	T	D	S	H	D					1
578	R	D	0				D	S	H	T	D	S	H	D					1
579	R	D	0				D	S	H	T	D	S	H	D					0
580	R	D	0				D	S	H	T	D	S	H	D					1
581	R	D	0				D	S	H	T	D	S	H	D					1
582	R	D	0				D	S	H	T	D	S	H	D					2
583	R	D	0			U	D	S	H	T	D	S	H	D					1
584	R	D	0				D	S	H	T	D	S	H	D					1
585	G	B	0	R	B		D	S	H	T									-1
586	G	B	0	R	B		D	S	H	T									-1
587	G	B	0	R	B		D	S	H	T									-1
588	G	B	0	R	B		D	S	H	T									-1
589	G	B	0	R	B		D	S	T	T									-1
590	G	B	0	R	B		D	S	H	T									1
591	G	B	0	R	B		D	S	H	T									1
592	G	B	0				D	S	H	T									-1
593	G	M	0				D	S	H	T									0
594	R	M	0	G	B		D	S	H	T									1
595	G	B	0	R	B		D	S	H	T									1
596	G	B	0	R	B		D	S	H	T									-2
597	G	B	0	R	B		D	S	H	T									2
598	G	B	0	R	B		D	S	H	T									-1
599	G	B	0	R	B		D	S	H	T									-1
600	G	M	0				D	S	H	T									1
601	G	M	0				D	S	H	T									1
602	F	B	0	G	B		D	S	C	D									1
603	F	B	0	G	B		D		C	D									-1
604	G	B	0				W	H	C	D									1
605	F	B	0	F	M		W		C	T									-1
606	F	B	0	F	M		W		C	T									-1
607	F	B	0	F	M		W		C	T									-1
608	F	B	0	F	M		W		C	T									-1
609	F	B	0	G	B		D	S	T	T									0
610	F	B	0				D	S	T	T									0
611	F	B	0				D	S	T	T									0

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
565	1	1	0	0	-1	1	1
566	1	1	0	0	-1	1	1
567	1	1	0	0	-1	1	1
568	0	0	-1	0	-1	0	0
569	0	0	1	0	-1	0	1
570	0	0	1	0	-1	0	1
571	0	2	0	0	0	0	1
572	0	2	0	0	0	0	1
573	0	-2	0	0	0	-1	-1
574	-1	0	0	0	0	-1	-1
575	-1	0	0	0	0	-1	-1
576	1	0	0	0	0	1	1
577	1	0	0	0	0	2	1
578	1	0	0	0	0	1	1
579	1	0	0	0	0	0	-1
580	1	0	0	0	0	1	1
581	1	0	0	0	0	1	1
582	1	1	0	0	0	1	1
583	1	1	0	0	-1	0	-1
584	1	1	0	0	0	1	1
585	-1	0	0	0	-1	0	0
586	-1	0	0	0	-1	-1	-1
587	-1	0	0	0	0	0	1
588	-1	0	0	0	-1	-1	-1
589	-1	0	0	0	0	-1	-1
590	1	0	0	0	0	1	1
591	1	0	0	0	0	1	1
592	-1	0	0	0	-1	-1	-1
593	0	0	0	0	-1	0	-1
594	1	0	0	0	0	1	1
595	1	0	0	0	0	1	1
596	-2	0	-1	0	0	-1	-1
597	2	0	1	0	0	1	1
598	-1	0	0	0	0	-1	-1
599	-1	0	0	0	0	-1	-1
600	1	0	0	0	-1	0	-1
601	1	0	0	0	-1	1	1
602	1	0	-1	0	-1	0	1
603	-1	0	-1	0	-1	0	-1
604	1	1	1	0	-1	1	1
605	0	0	-1	-1	-2	-1	-1
606	0	0	-1	-1	-2	-1	-1
607	0	0	-1	-1	-2	-1	-1
608	0	0	-1	-1	-2	-1	-1
609	0	0	0	1	0	0	-1
610	0	0	0	1	0	0	1
611	0	0	0	1	0	0	-1

Database of Variables

INSEQNO	WOFA1	WOFD1	POSTYPE	POST1	POST2	FRONT	DEPTH	TIME	SURPA	AEROA	STRA	CODE A	INTSTA	RERPA	CASA	FINSTA	STRD	CODE D	INTSTD
612	2.00	2.00	0	HD		0	0	0	2	-1	8,150	1	8,150	0	700	7,450	3,700	1	3,700
613	3.00	3.00	0	HD		0	0	0	2	-1	8,500	1	8,500	0	375	8,125	4,600	1	4,600
614	1.70	1.70	9	PD	FD				0	1	6,200	1	6,200	0	640	5,560	5,025	1	5,025
615	2.00	2.00	9	PD	FD				0	1	4,350	1	4,350	0	163	4,187	3,450	1	3,450
616	1.20	1.20	9	PD	FD				0	1	4,950	1	4,950	0	350	4,600	3,700	1	3,700
617	1.00	1.00	9	PD	FD				0	1	8,300	1	8,300	0	370	7,930	1,400	1	1,400
618	2.50	2.50	0	HD		0	0	0	0	-1	3,300	1	3,300	0	100	3,200	1,357	1	1,357
619	3.00	3.00	0	HD		0	0	0	0	-1	9,100	1	9,100	0	900	8,200	6,600	1	6,600
620	1.00	1.00	9	PD	FD				3	-1	4,100	1	4,100	0	200	3,900	3,900	1	3,900
621	9.00	9.00	9	PD	FD				3	-1	11,000	1	11,000	0	200	10,800	4,300	1	4,300
622	6.00	6.00	0	HD		0	0	0	3	-1	14,300	1	14,300	0	50	14,250	2,050	1	2,050
623	1.00	1.00	9	PD	FD				3	-1	12,800	1	12,800	0	200	12,600	4,150	1	4,150
624	12.00	12.00	9	HD	PD				3	-1	43,800	1	43,800	0	900	42,900	5,340	1	5,340
625	4.00	4.00	9	HD	PD				3	-1	16,000	1	16,000	0	770	15,230	5,740	1	5,740
626	39.00		9	HD					0		11,000	3			110		15,200	3	
627	40.30		9	DL					0		16,600	3			380		10,300	3	
628	52.00		9	DL					0		16,400	3			230		9,000	3	
629	73.00		9	DL					0		16,200	3			100		7,100	3	
630	19.00		9	HD					0		29,000	3			300		30,200	3	
631	8.10		9	PD					0		25,500	3			250		27,000	3	
632	24.00		9	HD					0		26,000	3			150		12,500	3	
633	24.00		9	HD					0		27,900	3			170		35,100	3	
634	24.00		9	DL					0		30,700	3			5,730		26,900	3	
635	32.00		9	HD					0		37,000	3			1,460		13,800	3	
636	32.00		9	PD					0		13,700	3			240		35,500	3	
637	19.00		9	DL					0		35,170	3					13,725	3	
638	5.00		9	PD					0		4,000	3			250		2,500	3	
639	6.00		9	HD					0		3,000	3			250		2,700	3	
641			9	PD					0		11,400	3			50		9,080	3	
642			9	PD					0		17,550	3			50		16,767	3	
643			9	PD					0		16,500	3			50		19,300	3	
644	7.00		9	FD					0		38,011	3			572		10,855	3	
645	26.00		9	PD					0		34,500	3			1,082		25,000	3	
646	2.00		9	PD					0		2,500	3			10		3,000	3	
647			9	PD					0		2,500	3			250		3,000	3	
648	2.00		9	PD					0		6,000	3			350		4,000	3	
649	2.00		9	PD					0		4,000	3			400		3,000	3	
650	6.00		9	FD					0		4,700	3			318		4,800	3	
651			9	FD					0		2,668	3			13		3,300	3	
652	6.00		9	FD					0		10,000	3			229		10,050	3	
653	5.00		9	PD					0		4,000	3			121		6,400	3	
654	44.00		9	PD					0		30,000	3					17,000	3	
655	10.00		9	PD					0		3,000	3			375		3,600	3	
657	96.00		9						3			0						0	
658	1.80		9						1		17,000	3					12,143	3	
659	5.00		9	HD					0		11,821	3					18,000	3	
660	0.82		9	PD					0		189	3					189	3	

Database of Variables

INSEQNO	RERPD	CASD	FINSTD	CAVA	TANKA	LTA	MBTA	ARTYA	FLYA	CTANKA	CARTYA	CFLYA	CAVD	TANKD	LTD	MBTD	ARTYD	FLYD	CTANKD	CARTYD	CFLYD
612	0	400	3,300	0	50	0	50	18	66	5			0	0	0	0	34	300	0		
613	0	600	4,000	0	30	0	30	24	66	4			0	8	0	8	34	300	0		
614	0	850	4,175	0	44	0	44	71	72	21	0	0	0	60	0	60	38	0	10		
615	0	100	3,350	0	0	0	0	53	0	0	0		0	0	0	0	38	0	0		
616	0	200	3,500	0	0	0	0	53	12	0	0		0	6	0	6	38	0	2		
617	0	250	1,150	0	28	0	28	124	0	0	0		0	0	0	0	12	0	0		
618	0	400	957	0	11	0	11	36	0	2			0	5	0	5	12	0	2		
619	0	720	5,880	0	121	0	121	99	0	41			0	33	0	33	52	0	13		
620	0	3,700	200	0	10	0	10	68	0	0			0	0	0	0	18	0	0	18	
621	0	300	4,000	0	26	0	26	66	0	7			0	0	0	0	59	0	0		
622	0	127	1,923	0	50	0	50	160	0	2			0	34	34	0	46	0	7	2	
623	0	3,535	615	0	120	0	120	120	0	2			0	0	0	0	38	0	0	28	
624	0	3,300	2,040	0	212	0	212	325	0	43			0	73	18	57	30	0	59	2	
625	0	700	5,040	0	78	0	78	248	0	20			0	4	0	4	59	0	3	0	
626		430		0	0			72	0	0			0	215			72				
627		940		0	200			70					0	0			72		0		
628		1,640		0	200			70					0	0			28		0		
629		1,350		0	215			72					0	0			23		0		
630		15,810		0	215			72	60				0	0			648		0		
631		6,120		0	215			162	0				0	0			748	0	0		
632		1,560		0	215			72	60				0	0			288		0		
633		4,780		0	215			72	60				0	0			103	0	0		
634		470		0	0			240		0			0	215			72				
635		150		0	0			192	60	0			0	118			85	60			
636		3,160		0	118			72	60				0	0			72		0		
637				0	410					350			0	160				60	11		
638		2,500		0	100			2		5			0	0			18	12	0		
639		270		0	60			6					0	25			16				
641		500		0	184			48	81	35			0	175			72	0	15		
642		500		0	224			72	81	35			0	366			108		30		
643		500		0	409			72	81	35			0	505			132		20		
644		850		0	71			200	3				0	0			125		0		
645		4,150		0	775					30			0	362				0	400		
646		10		0	0			2	38	0			0	0			8	0	0		
647		300		0	25			8		0			0	40			24	0	8		
648		600		0	75			24	206				0	90			16	0			
649		600		0	50			16	900				0	67			12				
650		3,000		0	72			27	72	16			0	38			32	0	15		
651		300		0	40			5	24	2			0	68			24	0	12		
652		3,433		0	108			32	34	5			0	108			130	24	20		
653		1,987		0	25			12	8	2			0	8			44	8	0		
654		14,300		0				100					0				78				
655		500		0	15			2		10			0	8			4		0		
657				0	2439					980			0	2160					2060		
658				0	218					72			0	238					161		
659		410		0	88			8	0	61			0	218					22		
660				0	14			0	0	7			0	10					1		

Database of Variables

INSEQNO	CEA	LOGSA	MOMNTA	TECHA	INITA	KMDA	CRIT	QUALA	RESA	MOBILA	AIRA	FPREPA	PLANA	SURPAA	MANA	LOGSAA	FORTSA	DEEPA	PRIA1	PRIA2
612	0	0	0	0	1	0.8		0	-1	0	-2	1	0	1	1	0	0	0	FF	
613	0	0	0	0	1	4		0	-1	0	-2	1	0	1	1	0	0	0	FF	
614	0	0	0	0	0	0.85		0	-1	0	0	0	-1	0	0	-1	-1	-1	FF	
615	0	0	0	0	0	0.15		0	-1	0	0	0	-1	0	0	0	-2	-1	FF	
616	0	0	0	0	0	0.5		0	-1	0	0	0	-1	0	-1	0	-1	-1	FF	
617	0	0	0	0	1	1.1		1	1	0	0	1	0	0	1	0	-1	-1	FF	
618	0	0	1	0	1	5		0	1	0	0	1	0	0	1	2	0	1	FF	
619	0	0	1	0	1	0.3		0	1	1	0	1	-1	0	1	0	0	-1	FF	
620	0	0	1	0	1	1		0	2	0	0	-1	2	2	2	1	0	2	FF	
621	0	0	1	0	1	2		0	-1	0	0	0	0	2	0	0	-1	1	FF	
622	0	0	1	0	1	4		0	2	-1	0	2	2	2	2	0	0	2	FF	
623	0	0	1	0	1	1.6		0	2	0	0	1	2	2	2	1	0	2	EE	LR
624	0	0	1	0	1	3.25		0	1	1	0	2	0	2	2	0	0	2	FF	RC
625	0	0	1	0	1	2		0	1	0	0	0	0	0	1	0	0	2	FF	
626						1.6													FF	
627						11.3														
628						23														
629						292														
630						3.2													FF	
631						12.9													RC	
632						19.3													FF	
633						14.5													FF	
634						50														
635						1													FF	
636						1.8													FF	
637																			FF	
638																			FF	
639																			FF	
641						7														
642						21														
643						15														
644						4.8													FF	
645						35.9999													FF	
646																			FF	
647																			FF	
648																			FF	
649																			FF	
650																			FF	
651																			FF	
652						26													FF	
653						30													FF	
654																			FF	
655																			FF	
657																			RC	
658						48													FF	
659																			EE	
660						0													FF	

Database of Variables

INSEQNO	PRIA2	SECA1	SECA2	SECA3	PRID1	PRID2	PRID3	SECD1	SECD2	SECD3	NOATP	ATPBYR1	ATPBMN1	ATPBDA1	ATPBHR1	ATPEYR1	ATPEMN1	ATPEDA1	ATPEHR1
612					DD						1	1944	8	7		1944	8	7	
613					DD						1	1944	8	7		1944	8	7	
614					DO	DE					1	1944	11	2		1944	11	5	
615		EE	RF		DO	FF					1	1944	11	2		1944	11	3	
616					DO	FF					1	1944	11	2		1944	11	4	
617					DD						1	1944	12	13		1944	12	16	
618		EE	LF		DD						1	1944	12	17		1944	12	17	
619					DD						1	1944	12	17		1944	12	19	
620		EE	RR		DD						1	1944	12	16		1944	12	19	
621		EE	LF		DD						1	1944	12	16		1944	12	16	
622					DO	FF					1	1944	12	16		1944	12	16	
623					DD						1	1944	12	16		1944	12	19	
624		DE			DD						1	1944	12	16		1944	12	18	
625		EE	RF		DD						1	1944	12	16		1944	12	17	
626											1	1950	9	16	5000	1950	9	17	5036
627											1	1950	9	18		1950	9	21	
628											1	1950	9	22		1950	9	24	
629											1	1950	9	25		1950	9	30	
630											1	1951	2	7		1951	2	11	
631											1	1951	3	7		1951	3	9	
632											1	1951	4	3		1951	4	5	
633											1	1951	4	20		1951	4	23	
634											1	1951	4	23		1951	4	27	
635											1	1951	6	1		1951	6	2	
636											1	1951	6	3		1951	6	4	
637											1	1944	5	1		1944	5	1	
638											1	1948	6	6		1948	6	10	
639											1	1948	7	9		1948	7	14	
641											1	1967	6	10		1967	6	10	
642											1	1967	6	10		1967	6	10	
643											1	1967	6	10		1967	6	10	
644											1	1944	5	3		1944	5	4	
645											1	1982	6	8		1982	6	10	
646											1	1948	5	13		1948	5	14	
647											1	1948	7	14		1948	7	18	
648											1	1948	12	25		1948	12	27	
649											1	1948	12	28		1949	1	6	
650											1	1956	10	30		1956	11	1	
651											1	1956	11	1		1956	11	2	
652											1	1956	11	1		1956	11	1	
653											1	1956	11	2	5000	1956	11	2	5020
654											1	1972	3	30		1972	4	28	
655											1	1948	4	21		1948	5	30	
657											1	1940	5	10		1940	5	21	
658											1	1940	5	13		1940	5	17	
659											1	1940	5	21		1940	5	22	
660											1	1940	6	1		1940	6	1	

Database of Variables

INSEQNO	TERRA1.1	TERRA1.2	TERRA1.3	TERRA2.1	TERRA2.2	TERRA2.3	WX1.1	WX1.2	WX1.3	WX1.4	WX2.1	WX2.2	WX2.3	WX2.4	WX3.1	WX3.2	WX3.3	WX3.4	LEADA
612	R	M	0				D	S	T	T									0
613	G	M	0				D	S	T	T									0
614	R	M	0	G	M		W	L	T	T									0
615	G	W	0				W	L	T	T									0
616	R	W	0				W	L	T	T									0
617	R	W	0				W	L	C	T									0
618	G	W	0				W	L	C	T									0
619	R	B	0	R	M		W	L	C	T									0
620	G	W	0	R	M		D		C	T									0
621	G	W	0				D		C	T									0
622	R	M	0				D		C	T									0
623	G	W	0				D		C	T									0
624	G	W	0				D		C	T									0
625	G	W	0				D		C	T									0
626							W	L	T	T									
627							D		T	T									
628							D		T	T									
629							D		T	T									
630							D		T	T									
631							D		T	T									
632							W	L	T	T									
633							W	L	T	T									
634							W	L	T	T									
635							W	H	T	T									
636	G		0				W	L	T	T									
637	F	B	0				W	L	T	T									
638	F	M	0				D		H	D									
639	F	M	0				D		H	D									
641	G	M	0				D		H	D									
642	G	M	0				D		H	D									
643	G	M	0				D		H	D									
644	F	M	0				D		T	T									
645	R	D	0				D		H	D									
646	F	M	0				D		T	D									
647	R	B	0				D		H	D									
648	F	B	0				D		T	D									
649	F	B	0				D		T	D									
650	F	B	0				D		H	D									
651	F	B	0				D		H	D									
652	F	B	0				D		H	D									
653	F	U	0				D		H	D									
654	F	M	0				D		T	E									
655	G	M	0				D		T	D									
657	R	M	0				W	L	T	T									
658	R	M	0				W	L	T	T									
659	R	M	0				D		T	T									
660	R	M	0				W	L	T	T									

Database of Variables

INSEQNO	TRNGA	MORALA	INTELA	WXA	TERRA	LEADAA	WINA
612	0	0	0	0	-1	0	-1
613	0	0	0	0	-1	0	-1
614	0	0	0	-1	-2	0	-1
615	0	0	0	-1	-2	0	-1
616	0	0	0	-1	-1	0	-1
617	1	0	-1	-1	-1	0	1
618	-1	0	0	1	-1	0	1
619	0	0	0	1	-1	0	-1
620	1	0	2	1	0	0	1
621	1	0	2	1	-1	0	1
622	0	0	2	1	1	0	1
623	1	0	2	1	0	0	1
624	0	0	2	1	-1	0	1
625	0	0	2	1	-1	0	1
626							-1
627							1
628							1
629							1
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633							1
634							1
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647							1
648							1
649							1
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651							1
652							1
653							1
654							1
655							0
657							1
658							1
659							-1
660							0

APPENDIX C

RESULTS

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 1	643	1	0.944360	1	0.055640	0	0.974261	1	0.025739	0	0.905124	1	0.094876	0	0.986856	1	0.013144	0	0.883208	1	0.116792	0	0.512503	1	0.487497	0
TR 2	125	1	0.944225	1	0.055775	0	-0.515955	-1	1.515955	2	0.839229	1	0.160771	0	0.451797	0	0.548203	1	0.187627	0	0.812373	1	0.395653	0	0.604347	1
TR 3	119	-1	-0.909173	-1	-0.090827	0	-0.904964	-1	-0.095036	0	-0.954306	-1	-0.045694	0	-0.511932	-1	-0.488068	0	-0.948914	-1	-0.051086	0	-0.417485	0	-0.582515	-1
TR 4	260	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.929176	1	0.070824	0	1.261284	1	-0.261284	0	1.282277	1	-0.282277	0	0.487827	0	0.512173	1
TR 5	523	1	0.943972	1	0.056028	0	0.898672	1	0.101328	0	0.937987	1	0.062013	0	0.390734	0	0.609266	1	0.341549	0	0.658451	1	0.168402	0	0.831598	1
TR 6	536	1	0.944360	1	0.055640	0	0.971647	1	0.028353	0	0.939145	1	0.060855	0	0.414096	0	0.585904	1	0.597882	1	0.402118	0	0.424529	0	0.575471	1
TR 7	578	1	0.944360	1	0.055640	0	0.972833	1	0.027167	0	0.936869	1	0.063131	0	1.069924	1	-0.069924	0	0.984890	1	0.015110	0	0.824300	1	0.175700	0
TR 8	649	1	0.944352	1	0.055648	0	0.944864	1	0.055136	0	0.931023	1	0.068977	0	0.991713	1	0.008287	0	0.903485	1	0.096515	0	0.396605	0	0.603395	1
TR 9	430	-1	-0.909173	-1	-0.090827	0	-0.904738	-1	-0.095262	0	-0.946655	-1	-0.053345	0	-1.087462	-1	0.087462	0	-0.509127	-1	-0.490873	0	-0.178487	0	-0.821513	-1
TR 10	326	-1	-0.909173	-1	-0.090827	0	-0.904539	-1	-0.095461	0	-0.251436	0	-0.748564	-1	-0.838876	-1	-0.161124	0	-1.051049	-1	0.051049	0	0.089667	0	-1.089667	-1
TR 11	466	-1	-0.909173	-1	-0.090827	0	-0.904696	-1	-0.095304	0	-0.204218	0	-0.795782	-1	-0.598508	-1	-0.401492	0	-0.618438	-1	-0.381562	0	0.208914	0	-1.208914	-1
TR 12	512	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.929759	1	0.070241	0	0.656719	1	0.343281	0	0.664762	1	0.335238	0	1.001037	1	-0.001037	0
TR 13	220	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.923655	1	0.076345	0	1.293260	1	-0.293260	0	1.022670	1	-0.022670	0	0.487746	0	0.512254	1
TR 14	68	-1	-0.909173	-1	-0.090827	0	-0.863852	-1	-0.136148	0	-0.960948	-1	-0.039052	0	-0.577030	-1	-0.422970	0	-0.000905	0	-0.999095	-1	-3.073004	-3	2.073004	2
TR 15	175	-1	-0.909173	-1	-0.090827	0	-0.900387	-1	-0.099613	0	-0.959980	-1	-0.040020	0	-0.592664	-1	-0.407336	0	-0.191268	0	-0.808732	-1	-0.920002	-1	-0.079998	0
TR 16	55	-1	-0.909173	-1	-0.090827	0	-0.904852	-1	-0.095148	0	-0.951966	-1	-0.048034	0	-0.453242	0	-0.546758	-1	-0.222144	0	-0.777856	-1	-0.276200	0	-0.723800	-1
TR 17	47	1	0.944360	1	0.055640	0	0.974562	1	0.025438	0	0.943090	1	0.056910	0	0.865922	1	0.134078	0	0.777426	1	0.222574	0	0.809448	1	0.190552	0
TR 18	238	-1	-0.909173	-1	-0.090827	0	-0.653186	-1	-0.346814	0	-0.960894	-1	-0.039106	0	-0.319234	0	-0.680766	-1	0.333809	0	-1.333809	-1	-1.246085	-1	0.246085	0
TR 19	614	-1	-0.909173	-1	-0.090827	0	-0.904632	-1	-0.095368	0	-0.155792	0	-0.844208	-1	-1.313776	-1	0.313776	0	-0.459563	0	-0.540437	-1	0.249561	0	-1.249561	-1
TR 20	501	1	0.944360	1	0.055640	0	0.974670	1	0.025330	0	0.941659	1	0.058341	0	0.638515	1	0.361485	0	0.739983	1	0.200017	0	0.511186	1	0.488814	0
TR 21	631	1	0.944360	1	0.055640	0	0.974663	1	0.025337	0	0.935843	1	0.064157	0	1.469001	1	-0.469001	0	1.376626	1	-0.376626	0	0.726500	1	0.273500	0
TR 22	75	1	0.944360	1	0.055640	0	0.974633	1	0.025367	0	0.941360	1	0.058640	0	1.186661	1	-0.186661	0	0.728745	1	0.271255	0	0.889708	1	0.110292	0
TR 23	541	1	0.944222	1	0.055778	0	0.738681	1	0.261319	0	0.205768	0	0.794232	1	0.573140	1	0.426860	0	0.299763	0	0.700237	1	0.148574	0	0.851426	1
TR 24	438	1	0.944360	1	0.055640	0	0.972081	1	0.027919	0	0.778800	1	0.221200	0	0.911864	1	0.088136	0	0.731940	1	0.268060	0	0.169101	0	0.830899	1
TR 25	109	-1	-0.909173	-1	-0.090827	0	-0.904821	-1	-0.095179	0	-0.950364	-1	-0.049636	0	-0.527030	-1	-0.472970	0	-0.642517	-1	-0.357483	0	-0.610343	-1	-0.389657	0
TR 26	52	1	0.944360	1	0.055640	0	0.973066	1	0.026934	0	0.943139	1	0.056861	0	0.712305	1	0.287695	0	0.435447	0	0.564553	1	0.820094	1	0.179906	0
TR 27	11	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.942750	1	0.057250	0	1.098291	1	-0.098291	0	0.970490	1	0.029510	0	1.166877	1	-0.166877	0
TR 28	432	1	-0.908010	-1	1.908010	2	0.927190	1	0.072810	0	0.639003	1	0.360997	0	-0.461022	0	1.461022	1	0.122122	0	0.877878	1	-0.035994	0	1.035994	1
TR 29	604	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.943138	1	0.056862	0	1.352044	1	-0.352044	0	1.361949	1	-0.361949	0	1.207172	1	-0.207172	0
TR 30	403	1	0.944360	1	0.055640	0	0.974338	1	0.025662	0	0.905137	1	0.094863	0	0.786270	1	0.213730	0	0.756508	1	0.243492	0	0.163759	0	0.836241	1
TR 31	623	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.942841	1	0.057159	0	1.542198	2	-0.542198	-1	1.794303	2	-0.794303	-1	1.093803	1	-0.093803	0
TR 32	257	-1	-0.909173	-1	-0.090827	0	-0.904943	-1	-0.095057	0	-0.928416	-1	-0.071584	0	-1.045589	-1	0.045589	0	-1.132861	-1	0.132861	0	-0.571961	-1	-0.428039	0
TR 33	385	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943142	1	0.056858	0	1.031621	1	-0.031621	0	1.364191	1	-0.364191	0	0.964268	1	0.035732	0
TR 34	275	-1	-0.877969	-1	-0.122031	0	-0.814027	-1	-0.185973	0	-0.251436	0	-0.748564	-1	-0.167296	0	-0.832704	-1	-0.285199	0	-0.714801	-1	0.089667	0	-1.089667	-1
TR 35	366	1	0.944360	1	0.055640	0	0.973399	1	0.026601	0	0.935673	1	0.064327	0	1.234602	1	-0.234602	0	0.682139	1	0.317861	0	0.904858	1	0.095142	0
TR 36	24	-1	-0.909173	-1	-0.090827	0	-0.901989	-1	-0.098011	0	-0.251436	0	-0.748564	-1	-0.538563	-1	-0.461437	0	-0.398423	0	-0.601577	-1	0.089667	0	-1.089667	-1
TR 37	208	-1	-0.909173	-1	-0.090827	0	-0.903959	-1	-0.096041	0	-0.895868	-1	-0.104132	0	-0.478441	0	-0.521559	-1	-0.293660	0	-0.706340	-1	-0.222592	0	-0.777408	-1
TR 38	398	-1	-0.909173	-1	-0.090827	0	-0.902650	-1	-0.097350	0	-0.854832	-1	-0.145168	0	-0.541604	-1	-0.458396	0	-0.273205	0	-0.726795	-1	-0.294659	0	-0.705341	-1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 39	353	1	0.944360	1	0.055640	0	0.974610	1	0.025390	0	0.853696	1	0.146304	0	0.627091	1	0.372909	0	0.899032	1	0.100968	0	0.564438	1	0.435562	0
TR 40	300	0	-0.909173	-1	0.909173	1	-0.903904	-1	0.903904	1	-0.950561	-1	0.950561	1	-0.697179	-1	0.697179	1	-0.601733	-1	0.601733	1	-0.355454	0	0.355454	0
TR 41	312	-1	-0.909173	-1	-0.090827	0	-0.904327	-1	-0.095673	0	-0.663786	-1	-0.336214	0	-0.665248	-1	-0.334752	0	-0.800194	-1	-0.199806	0	-0.144516	0	-0.855484	-1
TR 42	532	-1	-0.909148	-1	-0.090852	0	-0.899448	-1	-0.100552	0	0.409952	0	-1.409952	-1	-0.257782	0	-0.742218	-1	-0.162552	0	-0.837448	-1	0.188006	0	-1.188006	-1
TR 43	118	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943117	1	0.056883	0	1.249204	1	-0.249204	0	1.559124	2	-0.559124	-1	0.689133	1	0.310867	0
TR 44	174	-1	-0.909173	-1	-0.090827	0	-0.904760	-1	-0.095240	0	-0.890528	-1	-0.109472	0	-0.225865	0	-0.774135	-1	-0.417197	0	-0.582803	-1	0.519588	1	-1.519588	-2
TR 45	88	-1	0.944360	1	-1.944360	-2	-0.173505	0	-0.826495	-1	0.943117	1	-1.943117	-2	0.980548	1	-1.980548	-2	0.308088	0	-1.308088	-1	1.408405	1	-2.408405	-2
TR 46	309	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943146	1	0.056854	0	1.008127	1	-0.008127	0	0.759916	1	0.240084	0	1.065772	1	-0.065772	0
TR 47	601	1	0.944360	1	0.055640	0	0.974649	1	0.025351	0	0.942788	1	0.057212	0	0.727367	1	0.272633	0	0.640301	1	0.359699	0	0.935685	1	0.064315	0
TR 48	146	1	0.944360	1	0.055640	0	0.974249	1	0.025751	0	0.943161	1	0.056839	0	1.605352	2	-0.605352	-1	0.812450	1	0.187550	0	1.021868	1	-0.021868	0
TR 49	613	-1	-0.909173	-1	-0.090827	0	-0.796943	-1	-0.203057	0	0.573993	1	-1.573993	-2	-0.603276	-1	-0.396724	0	-0.390441	0	-0.609559	-1	0.205956	0	-1.205956	-1
TR 50	302	1	0.944360	1	0.055640	0	0.974668	1	0.025332	0	0.943064	1	0.056936	0	1.345681	1	-0.345681	0	0.930731	1	0.069269	0	0.846684	1	0.153316	0
TR 51	209	-1	-0.909173	-1	-0.090827	0	-0.904888	-1	-0.095112	0	-0.960821	-1	-0.039179	0	-1.205603	-1	0.205603	0	-0.836440	-1	-0.163560	0	-1.243881	-1	0.243881	0
TR 52	619	-1	0.942829	1	-1.942829	-2	-0.566552	-1	-0.433448	0	0.905790	1	-1.905790	-2	0.415673	0	-1.415673	-1	0.546010	1	-1.546010	-2	0.349648	0	-1.349648	-1
TR 53	328	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.943120	1	0.056880	0	0.452343	0	0.547657	1	0.301491	0	0.698509	1	0.868354	1	0.131646	0
TR 54	318	1	0.943997	1	0.056003	0	0.960417	1	0.039583	0	0.943108	1	0.056892	0	0.868836	1	0.131164	0	0.143472	0	0.856528	1	1.109245	1	-0.109245	0
TR 55	1	-1	-0.909173	-1	-0.090827	0	-0.904956	-1	-0.095044	0	-0.958319	-1	-0.041681	0	-1.117231	-1	0.117231	0	-0.793439	-1	-0.206561	0	-0.784002	-1	-0.215998	0
TR 56	600	-1	-0.909172	-1	-0.090828	0	-0.892358	-1	-0.107642	0	-0.140131	0	-0.859869	-1	-0.304861	0	-0.695139	-1	-0.164339	0	-0.835661	-1	0.253845	0	-1.253845	-1
TR 57	420	-1	-0.827075	-1	-0.172925	0	-0.901147	-1	-0.098853	0	-0.431320	0	-0.568680	-1	0.127291	0	-1.127291	-1	-0.008150	0	-0.991850	-1	0.094225	0	-1.094225	-1
TR 58	621	1	0.944332	1	0.055668	0	0.931435	1	0.068565	0	0.943066	1	0.056934	0	0.726510	1	0.273490	0	0.022630	0	0.977370	1	1.152709	1	-0.152709	0
TR 59	213	-1	-0.909173	-1	-0.090827	0	-0.904963	-1	-0.095037	0	-0.959032	-1	-0.040968	0	-1.297952	-1	0.297952	0	-1.024828	-1	0.024828	0	-0.747146	-1	-0.252854	0
TR 60	198	1	0.944160	1	0.055840	0	0.972551	1	0.027449	0	0.496634	0	0.503366	1	0.367049	0	0.632951	1	0.518201	1	0.481799	0	0.370024	0	0.629976	1
TR 61	268	0	0.156179	0	-0.156179	0	-0.437568	0	0.437568	0	-0.886071	-1	0.886071	1	-0.616972	-1	0.616972	1	-0.336539	0	0.336539	0	-0.348161	0	0.348161	0
TR 62	450	1	0.944360	1	0.055640	0	0.974558	1	0.025442	0	0.205768	0	0.794232	1	0.919913	1	0.080087	0	1.136554	1	-0.136554	0	0.148574	0	0.851426	1
TR 63	181	-1	-0.909173	-1	-0.090827	0	-0.904835	-1	-0.095165	0	-0.958610	-1	-0.041390	0	-0.830977	-1	-0.169023	0	-0.314036	0	-0.685964	-1	-0.954996	-1	-0.045004	0
TR 64	349	1	0.944360	1	0.055640	0	0.973626	1	0.026374	0	0.556999	1	0.443001	0	0.696609	1	0.303391	0	0.750903	1	0.249097	0	0.394044	0	0.605956	1
TR 65	495	1	0.943553	1	0.056447	0	0.972482	1	0.027518	0	0.941110	1	0.058890	0	0.454773	0	0.545227	1	0.718607	1	0.281393	0	0.285816	0	0.714184	1
TR 66	442	0	0.687504	1	-0.687504	-1	0.676027	1	-0.676027	-1	0.401019	0	-0.401019	0	0.296706	0	-0.296706	0	0.384371	0	-0.384371	0	0.224099	0	-0.224099	0
TR 67	340	-1	-0.909173	-1	-0.090827	0	-0.904969	-1	-0.095031	0	-0.913398	-1	-0.086602	0	-0.781815	-1	-0.218185	0	-1.195955	-1	0.195955	0	0.396890	0	-1.396890	-1
TR 68	392	-1	-0.909173	-1	-0.090827	0	-0.904905	-1	-0.095095	0	-0.923141	-1	-0.076859	0	-1.358830	-1	0.358830	0	-0.883133	-1	-0.116867	0	-0.370154	0	-0.629846	-1
TR 69	5	1	0.944360	1	0.055640	0	0.957767	1	0.042233	0	0.943148	1	0.056852	0	0.881014	1	0.118986	0	0.631073	1	0.368927	0	1.028021	1	-0.028021	0
TR 70	471	1	0.944340	1	0.055660	0	0.509663	1	0.490337	0	0.175609	0	0.824391	1	0.250604	0	0.749396	1	0.427343	0	0.572657	1	-0.201898	0	1.201898	1
TR 71	138	1	0.944156	1	0.055844	0	0.971886	1	0.028114	0	-0.923827	-1	1.923827	2	0.332119	0	0.667881	1	0.903104	1	0.096896	0	-0.806053	-1	1.806053	2
TR 72	34	1	0.944360	1	0.055640	0	0.972268	1	0.027732	0	0.943139	1	0.056861	0	0.536488	1	0.463512	0	0.643385	1	0.356615	0	0.820094	1	0.179906	0
TR 73	313	1	-0.909164	-1	1.909164	2	-0.767674	-1	1.767674	2	0.573993	1	0.426007	0	-0.373384	0	1.373384	1	-0.309644	0	1.309644	1	0.205956	0	0.794044	1
TR 74	546	1	0.944360	1	0.055640	0	0.974677	1	0.025323	0	0.911212	1	0.088788	0	0.781518	1	0.218482	0	0.947167	1	0.052833	0	0.281343	0	0.718657	1
TR 75	301	-1	-0.909173	-1	-0.090827	0	-0.904844	-1	-0.095156	0	-0.960308	-1	-0.039692	0	-0.892177	-1	-0.107823	0	-0.974396	-1	-0.025604	0	-0.875562	-1	-0.124438	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 76	579	-1	-0.909173	-1	-0.090827	0	-0.904968	-1	-0.095032	0	-0.912930	-1	-0.087070	0	-0.513907	-1	-0.486093	0	-0.430086	0	-0.569914	-1	0.104519	0	-1.104519	-1
TR 77	658	1	0.944348	1	0.055652	0	0.973840	1	0.026160	0	0.557842	1	0.442158	0	0.566884	1	0.433116	0	0.606302	1	0.393698	0	0.108549	0	0.891451	1
TR 78	149	-1	-0.909173	-1	-0.090827	0	-0.904328	-1	-0.095674	0	-0.959483	-1	-0.040517	0	-0.789050	-1	-0.210950	0	-0.641114	-1	-0.358886	0	-0.731961	-1	-0.268039	0
TR 79	303	-1	-0.909173	-1	-0.090827	0	-0.891551	-1	-0.108449	0	0.255573	0	-1.255573	-1	-0.743711	-1	-0.256289	0	-0.742327	-1	-0.257673	0	0.104852	0	-1.104852	-1
TR 80	651	1	0.833519	1	0.166481	0	0.634416	1	0.365584	0	-0.077336	0	1.077336	1	0.450661	0	0.549339	1	0.474250	0	0.525750	1	0.492357	0	0.507643	1
TR 81	497	1	0.944360	1	0.055640	0	0.747035	1	0.252965	0	0.937558	1	0.062442	0	0.687417	1	0.312583	0	0.303063	0	0.696937	1	0.674401	1	0.325599	0
TR 82	311	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943057	1	0.056943	0	0.802990	1	0.197010	0	0.711620	1	0.288380	0	0.830413	1	0.169587	0
TR 83	258	-1	-0.909173	-1	-0.090827	0	-0.899090	-1	-0.100910	0	-0.958003	-1	-0.041997	0	-0.580684	-1	-0.419316	0	-0.497414	0	-0.502586	-1	-0.667713	-1	-0.332287	0
TR 84	607	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960911	-1	-0.039089	0	-1.032000	-1	0.032000	0	-1.047913	-1	0.047913	0	-0.871402	-1	-0.128598	0
TR 85	402	-1	-0.909173	-1	-0.090827	0	-0.904945	-1	-0.095055	0	-0.724627	-1	-0.275373	0	-0.896418	-1	-0.103582	0	-0.633489	-1	-0.366511	0	0.003863	0	-1.003863	-1
TR 86	249	1	0.944218	1	0.055782	0	0.973760	1	0.026240	0	-0.251436	0	1.251436	1	0.013516	0	0.986484	1	0.118230	0	0.881770	1	0.089667	0	0.910333	1
TR 87	218	1	0.944351	1	0.055649	0	0.973993	1	0.026007	0	0.911212	1	0.088788	0	0.499930	0	0.500070	1	1.040918	1	-0.040918	0	0.281343	0	0.718657	1
TR 88	150	1	0.944360	1	0.055640	0	0.966585	1	0.033415	0	0.943139	1	0.056861	0	0.748591	1	0.251409	0	0.738168	1	0.261832	0	0.820094	1	0.179906	0
TR 89	130	-1	-0.909173	-1	-0.090827	0	-0.805525	-1	-0.194475	0	-0.960471	-1	-0.039529	0	-0.486126	0	-0.513874	-1	-0.192495	0	-0.807505	-1	-0.630320	-1	-0.369680	0
TR 90	626	-1	-0.909172	-1	-0.090828	0	-0.897836	-1	-0.102164	0	0.467125	0	-1.467125	-1	-0.350355	0	-0.649645	-1	0.127774	0	-1.127774	-1	0.414535	0	-1.414535	-1
TR 91	131	-1	-0.909173	-1	-0.090827	0	-0.902331	-1	-0.097669	0	0.496634	0	-1.496634	-1	-0.938368	-1	-0.061632	0	-0.876644	-1	-0.123356	0	0.370024	0	-1.370024	-1
TR 92	270	0	0.482248	0	-0.482248	0	-0.742664	-1	0.742664	1	-0.923827	-1	0.923827	1	-0.510798	-1	0.510798	1	-0.152478	0	0.152478	0	-0.806053	-1	0.806053	1
TR 93	558	0	0.944360	1	-0.944360	-1	0.973003	1	-0.973003	-1	0.942999	1	-0.942999	-1	1.019680	1	-1.019680	-1	0.805088	1	-0.805088	-1	1.058058	1	-1.058058	-1
TR 94	415	-1	-0.909145	-1	-0.090855	0	-0.904868	-1	-0.095132	0	-0.431320	0	-0.568680	-1	0.032565	0	-1.032565	-1	-0.133795	0	-0.866205	-1	0.094225	0	-1.094225	-1
TR 95	379	1	0.944304	1	0.055696	0	0.969195	1	0.030805	0	0.686052	1	0.313948	0	0.539220	1	0.460780	0	0.369467	0	0.630533	1	0.957134	1	0.042866	0
TR 96	297	-1	-0.909173	-1	-0.090827	0	-0.903760	-1	-0.096240	0	-0.954086	-1	-0.045914	0	-0.824586	-1	-0.175414	0	-0.736386	-1	-0.263614	0	-0.377506	0	-0.622494	-1
TR 97	599	-1	-0.909173	-1	-0.090827	0	-0.904959	-1	-0.095041	0	-0.957801	-1	-0.042199	0	-0.098156	0	-0.901844	-1	-0.414479	0	-0.585521	-1	-0.545063	-1	-0.454937	0
TR 98	233	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943087	1	0.056913	0	1.230924	1	-0.230924	0	1.170487	1	-0.170487	0	0.760880	1	0.239120	0
TR 99	231	-1	-0.909173	-1	-0.090827	0	-0.904968	-1	-0.095032	0	-0.117491	0	-0.882509	-1	-0.464758	0	-0.535242	-1	-0.529763	-1	-0.470237	0	0.111718	0	-1.111718	-1
TR 100	638	1	0.944359	1	0.055641	0	0.974506	1	0.025494	0	-0.178671	0	1.178671	1	0.578456	1	0.421544	0	0.642509	1	0.357491	0	0.470306	0	0.529694	1
TR 101	293	-1	-0.909173	-1	-0.090827	0	-0.879245	-1	-0.120755	0	-0.934400	-1	-0.065600	0	-0.597103	-1	-0.402897	0	-0.456109	0	-0.543891	-1	-0.094117	0	-0.905883	-1
TR 102	359	1	0.944360	1	0.055640	0	0.974674	1	0.025326	0	0.931585	1	0.068415	0	1.000892	1	-0.000892	0	1.252273	1	-0.252273	0	0.556226	1	0.443774	0
TR 103	217	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.700617	1	0.299383	0	0.858373	1	0.141627	0	1.307544	1	-0.307544	0	0.308240	0	0.691760	1
TR 104	509	-1	0.944360	1	-1.944360	-2	0.970754	1	-1.970754	-2	0.940833	1	-1.940833	-2	0.450603	0	-1.450603	-1	0.496600	0	-1.496600	-1	0.382332	0	-1.382332	-1
TR 105	14	1	0.944360	1	0.055640	0	0.974672	1	0.025328	0	0.943163	1	0.056837	0	0.963597	1	0.036403	0	1.039701	1	-0.039701	0	1.041544	1	-0.041544	0
TR 106	135	-1	-0.909173	-1	-0.090827	0	-0.900206	-1	-0.099794	0	-0.947774	-1	-0.052226	0	-1.001108	-1	0.001108	0	-0.577224	-1	-0.422776	0	-0.611500	-1	-0.388500	0
TR 107	418	1	0.918478	1	0.081522	0	0.792726	1	0.207274	0	0.845647	1	0.154353	0	0.290490	0	0.709510	1	0.414858	0	0.585142	1	0.121586	0	0.878414	1
TR 108	592	-1	-0.909173	-1	-0.090827	0	-0.904968	-1	-0.095032	0	-0.959020	-1	-0.040980	0	-0.985703	-1	-0.014297	0	-0.934235	-1	-0.065765	0	-0.486157	0	-0.513843	-1
TR 109	486	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943122	1	0.056878	0	2.162836	2	-1.162836	-1	2.313020	2	-1.313020	-1	1.001123	1	-0.001123	0
TR 110	553	1	0.944360	1	0.055640	0	0.970765	1	0.029235	0	0.942867	1	0.057133	0	0.880287	1	0.119713	0	0.575676	1	0.424324	0	1.057410	1	-0.057410	0
TR 111	127	1	0.944360	1	0.055640	0	0.972916	1	0.027084	0	0.943157	1	0.056843	0	0.564932	1	0.435068	0	0.114376	0	0.885624	1	1.089804	1	-0.089804	0
TR 112	547	0	-0.352483	0	0.352483	0	0.970332	1	-0.970332	-1	0.223824	0	-0.223824	0	0.901331	1	-0.901331	-1	0.734556	1	-0.734556	-1	0.537540	1	-0.537540	-1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 113	636	1	0.944360	1	0.055640	0	0.974647	1	0.025353	0	0.913319	1	0.086681	0	0.769784	1	0.230216	0	0.910587	1	0.089413	0	0.566498	1	0.433502	0
TR 114	216	0	0.676477	1	-0.676477	-1	0.811260	1	-0.811260	-1	-0.273277	0	0.273277	0	0.117708	0	-0.117708	0	0.500656	1	-0.500656	-1	0.071718	0	-0.071718	0
TR 115	285	-1	-0.909173	-1	-0.090827	0	-0.875465	-1	-0.124535	0	-0.886071	-1	-0.113929	0	-0.228428	0	-0.771572	-1	-0.000723	0	-0.999277	-1	-0.348161	0	-0.651839	-1
TR 116	426	1	0.944347	1	0.055653	0	0.974564	1	0.025436	0	0.891213	1	0.108787	0	0.053032	0	0.946968	1	0.506281	1	0.493719	0	0.077955	0	0.922045	1
TR 117	356	1	0.944360	1	0.055640	0	0.973215	1	0.026785	0	0.853696	1	0.146304	0	0.873105	1	0.126895	0	0.900641	1	0.099359	0	0.564438	1	0.435562	0
TR 118	455	1	0.944360	1	0.055640	0	0.946581	1	0.053419	0	0.205768	0	0.794232	1	0.376370	0	0.623630	1	0.794215	1	0.205785	0	0.148574	0	0.851426	1
TR 119	121	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943157	1	0.056843	0	1.628993	2	-0.628993	-1	1.237494	1	-0.237494	0	1.089804	1	-0.089804	0
TR 120	355	1	0.944359	1	0.055641	0	0.974643	1	0.025357	0	0.853696	1	0.146304	0	0.616682	1	0.383318	0	0.877000	1	0.123000	0	0.564438	1	0.435562	0
TR 121	256	1	0.944360	1	0.055640	0	0.912948	1	0.087052	0	0.942676	1	0.057324	0	0.518365	1	0.481635	0	0.098975	0	0.901025	1	0.967610	1	0.032390	0
TR 122	190	1	0.944360	1	0.055640	0	0.974231	1	0.025769	0	0.901096	1	0.098904	0	1.148914	1	-0.148914	0	0.940002	1	0.059998	0	0.486312	0	0.513688	1
TR 123	469	-1	-0.909173	-1	-0.090827	0	-0.904271	-1	-0.095729	0	-0.812926	-1	-0.187074	0	-0.317439	0	-0.682561	-1	-0.133270	0	-0.866730	-1	-0.048961	0	-0.951039	-1
TR 124	299	-1	-0.909173	-1	-0.090827	0	-0.903841	-1	-0.096159	0	-0.703771	-1	-0.296229	0	-0.298065	0	-0.701935	-1	-0.567470	-1	-0.432530	0	0.092007	0	-1.092007	-1
TR 125	206	-1	-0.909173	-1	-0.090827	0	-0.881377	-1	-0.118623	0	-0.824691	-1	-0.175309	0	-0.209977	0	-0.790023	-1	-0.041165	0	-0.958835	-1	-0.339136	0	-0.660864	-1
TR 126	113	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.943135	1	0.056865	0	1.561668	2	-0.561668	-1	1.470130	1	-0.470130	0	1.284219	1	-0.284219	0
TR 127	642	1	0.944360	1	0.055640	0	0.974500	1	0.025500	0	0.905124	1	0.094876	0	0.939453	1	0.060547	0	0.949697	1	0.050303	0	0.512503	1	0.487497	0
TR 128	363	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.931585	1	0.068415	0	0.683611	1	0.316389	0	0.967395	1	0.032605	0	0.556226	1	0.443774	0
TR 129	377	1	0.944323	1	0.055677	0	0.965157	1	0.034843	0	0.686052	1	0.313948	0	0.675689	1	0.324311	0	0.396061	0	0.603939	1	0.957134	1	0.042866	0
TR 130	18	1	0.943259	1	0.056741	0	0.972876	1	0.027124	0	-0.251436	0	1.251436	1	0.125273	0	0.874727	1	0.412308	0	0.587692	1	0.089667	0	0.910333	1
TR 131	565	1	0.944360	1	0.055640	0	0.971924	1	0.028076	0	0.943153	1	0.056847	0	0.406072	0	0.593928	1	0.578249	1	0.421751	0	1.154258	1	-0.154258	0
TR 132	333	1	0.932447	1	0.067553	0	0.974648	1	0.025352	0	0.934954	1	0.065046	0	0.402067	0	0.597933	1	0.679034	1	0.320966	0	0.322161	0	0.677839	1
TR 133	101	-1	-0.909173	-1	-0.090827	0	-0.904954	-1	-0.095046	0	-0.881856	-1	-0.118144	0	-0.855315	-1	-0.144685	0	-0.813536	-1	-0.186464	0	-0.043784	0	-0.956216	-1
TR 134	283	1	0.944360	1	0.055640	0	0.850828	1	0.149172	0	0.942573	1	0.057427	0	0.514390	1	0.485610	0	0.144252	0	0.855748	1	0.771506	1	0.228494	0
TR 135	84	1	0.944325	1	0.055675	0	0.973230	1	0.026770	0	0.939441	1	0.060559	0	1.044582	1	-0.044582	0	0.810218	1	0.189782	0	0.646992	1	0.353008	0
TR 136	185	-1	-0.909173	-1	-0.090827	0	-0.901651	-1	-0.098349	0	0.205768	0	-1.205768	-1	-0.287691	0	-0.712309	-1	-0.257270	0	-0.742730	-1	0.148574	0	-1.148574	-1
TR 137	61	1	0.944360	1	0.055640	0	0.974615	1	0.025385	0	0.943120	1	0.056880	0	0.864847	1	0.135153	0	0.663383	1	0.336617	0	0.761187	1	0.238813	0
TR 138	163	1	0.944360	1	0.055640	0	0.972976	1	0.027024	0	0.942189	1	0.057811	0	0.697430	1	0.302570	0	0.700887	1	0.299113	0	0.878302	1	0.121698	0
TR 139	618	1	0.944360	1	0.055640	0	0.974053	1	0.025947	0	0.942016	1	0.057984	0	1.026333	1	-0.026333	0	1.095259	1	-0.095259	0	0.609110	1	0.390890	0
TR 140	229	-1	-0.909173	-1	-0.090827	0	-0.903825	-1	-0.096175	0	-0.960890	-1	-0.039110	0	-0.913153	-1	-0.086847	0	-1.015198	-1	0.015198	0	-0.945361	-1	-0.054639	0
TR 141	324	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943167	1	0.056833	0	1.039304	1	-0.039304	0	1.093384	1	-0.093384	0	1.398992	1	-0.398992	0
TR 142	215	-1	-0.909173	-1	-0.090827	0	-0.904262	-1	-0.095738	0	-0.912102	-1	-0.087898	0	-0.834212	-1	-0.165788	0	-0.884107	-1	-0.115893	0	-0.398015	0	-0.601985	-1
TR 143	505	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.940921	1	0.059079	0	1.542181	2	-0.542181	-1	2.253596	2	-1.253596	-1	0.662395	1	0.337605	0
TR 144	178	-1	-0.909173	-1	-0.090827	0	-0.904579	-1	-0.095421	0	-0.251436	0	-0.748564	-1	-1.102917	-1	0.102917	0	-0.958223	-1	-0.041777	0	0.089667	0	-1.089667	-1
TR 145	585	0	0.943419	1	-0.943419	-1	-0.522321	-1	0.522321	1	0.473141	0	-0.473141	0	0.121444	0	-0.121444	0	0.157009	0	-0.157009	0	0.097304	0	-0.097304	0
TR 146	17	1	0.944360	1	0.055640	0	0.974675	1	0.025325	0	0.943157	1	0.056843	0	0.898644	1	0.101356	0	0.995295	1	0.004705	0	1.089804	1	-0.089804	0
TR 147	525	-1	-0.909173	-1	-0.090827	0	-0.904201	-1	-0.095799	0	-0.958909	-1	-0.041091	0	-0.619336	-1	-0.380664	0	-0.368998	0	-0.631002	-1	-0.429407	0	-0.570593	-1
TR 148	30	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943147	1	0.056853	0	1.323846	1	-0.323846	0	1.313213	1	-0.313213	0	0.842145	1	0.157855	0
TR 149	7	1	0.944360	1	0.055640	0	0.974672	1	0.025328	0	0.943120	1	0.056880	0	1.000531	1	-0.000531	0	0.854982	1	0.145018	0	0.868354	1	0.131646	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 150	183	-1	-0.909173	-1	-0.090827	0	-0.901093	-1	-0.098907	0	-0.251436	0	-0.748564	-1	-0.223813	0	-0.776187	-1	-0.158996	0	-0.841004	-1	0.089667	0	-1.089667	-1
TR 151	2	1	0.944360	1	0.055640	0	0.973922	1	0.026078	0	0.943057	1	0.056943	0	1.391772	1	-0.391772	0	1.143936	1	-0.143936	0	0.830413	1	0.169587	0
TR 152	307	0	-0.100015	0	0.100015	0	0.958626	1	-0.958626	-1	-0.251436	0	0.251436	0	0.055496	0	-0.055496	0	0.379781	0	-0.379781	0	0.089667	0	-0.089667	0
TR 153	116	-1	-0.823021	-1	-0.176979	0	-0.899421	-1	-0.100579	0	-0.371970	0	-0.628030	-1	0.179419	0	-1.179419	-1	-0.381669	0	-0.618331	-1	0.050379	0	-1.050379	-1
TR 154	548	1	0.944360	1	0.055640	0	0.974391	1	0.025609	0	0.935106	1	0.064894	0	1.341729	1	-0.341729	0	1.124964	1	-0.124964	0	0.571356	1	0.428644	0
TR 155	281	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943171	1	0.056829	0	1.599657	2	-0.599657	-1	1.393120	1	-0.393120	0	1.376087	1	-0.376087	0
TR 156	414	1	0.944360	1	0.055640	0	0.965779	1	0.034221	0	0.107411	0	0.892589	1	0.809150	1	0.190850	0	0.592862	1	0.407138	0	0.234377	0	0.765623	1
TR 157	277	-1	-0.909018	-1	-0.090982	0	-0.734005	-1	-0.265995	0	-0.959025	-1	-0.040975	0	-0.260151	0	-0.739849	-1	0.076217	0	-1.076217	-1	-0.287820	0	-0.712180	-1
TR 158	478	1	0.944357	1	0.055643	0	0.974502	1	0.025498	0	0.679692	1	0.320308	0	0.675125	1	0.324875	0	0.768265	1	0.231735	0	0.094965	0	0.905035	1
TR 159	381	1	0.944360	1	0.055640	0	0.972466	1	0.027534	0	0.686052	1	0.313948	0	0.988571	1	0.011429	0	0.865642	1	0.134358	0	0.957134	1	0.042866	0
TR 160	161	1	0.944360	1	0.055640	0	0.974667	1	0.025333	0	0.943115	1	0.056885	0	1.248181	1	-0.248181	0	1.135868	1	-0.135868	0	1.001717	1	-0.001717	0
TR 161	133	1	0.944360	1	0.055640	0	0.974446	1	0.025554	0	0.943134	1	0.056866	0	1.162316	1	-0.162316	0	0.768129	1	0.231871	0	0.997563	1	0.002437	0
TR 162	172	-1	-0.909173	-1	-0.090827	0	-0.902223	-1	-0.097777	0	-0.251436	0	-0.748564	-1	-0.433860	0	-0.566140	-1	-0.323597	0	-0.676403	-1	0.089667	0	-1.089667	-1
TR 163	587	1	0.944359	1	0.055641	0	0.767136	1	0.232864	0	0.700065	1	0.299935	0	0.452863	0	0.547137	1	0.358379	0	0.641621	1	0.038398	0	0.961602	1
TR 164	321	1	0.943109	1	0.056891	0	0.971578	1	0.028422	0	-0.251436	0	1.251436	1	0.641133	1	0.358867	0	0.949284	1	0.050716	0	0.089667	0	0.910333	1
TR 165	529	1	0.944358	1	0.055642	0	0.958576	1	0.041424	0	0.573993	1	0.426007	0	0.598752	1	0.401248	0	0.387720	0	0.612280	1	0.205958	0	0.794044	1
TR 166	488	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943173	1	0.056827	0	1.626121	2	-0.626121	-1	1.773236	2	-0.773236	-1	2.063517	2	-1.063517	-1
TR 167	317	-1	-0.909173	-1	-0.090827	0	-0.904891	-1	-0.095109	0	-0.958103	-1	-0.041897	0	-0.341690	0	-0.658310	-1	-0.527796	-1	-0.472204	0	-0.472441	0	-0.527559	-1
TR 168	189	-1	-0.909173	-1	-0.090827	0	-0.904931	-1	-0.095069	0	-0.959771	-1	-0.040229	0	-0.684814	-1	-0.315186	0	-0.856708	-1	-0.143292	0	-0.577104	-1	-0.422896	0
TR 169	235	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943157	1	0.056843	0	1.507165	2	-0.507165	-1	1.100034	1	-0.100034	0	1.089804	1	-0.089804	0
TR 170	448	0	0.508642	1	-0.508642	-1	-0.509008	-1	0.509008	1	-0.251436	0	0.251436	0	-0.220563	0	0.220563	0	0.002376	0	-0.002376	0	0.089667	0	-0.089667	0
TR 171	468	1	0.944359	1	0.055641	0	0.973601	1	0.026399	0	-0.204218	0	1.204218	1	1.030337	1	-0.030337	0	1.025961	1	-0.025961	0	0.208914	0	0.791086	1
TR 172	625	1	0.944360	1	0.055640	0	0.926080	1	0.073920	0	0.943073	1	0.056927	0	0.630122	1	0.369878	0	0.458850	0	0.541150	1	1.238513	1	-0.238513	0
TR 173	81	1	0.944360	1	0.055640	0	0.974607	1	0.025393	0	0.889773	1	0.110227	0	0.697013	1	0.302987	0	0.872350	1	0.127650	0	0.117446	0	0.882554	1
TR 174	393	1	0.944360	1	0.055640	0	0.974631	1	0.025369	0	0.939145	1	0.060855	0	0.726792	1	0.273208	0	1.070561	1	-0.070561	0	0.424529	0	0.575471	1
TR 175	142	1	0.944360	1	0.055640	0	0.974650	1	0.025350	0	0.938730	1	0.061270	0	0.616330	1	0.383670	0	0.960470	1	0.039530	0	0.502793	1	0.497207	0
TR 176	107	-1	-0.909173	-1	-0.090827	0	-0.904968	-1	-0.095032	0	-0.960711	-1	-0.039289	0	-1.223138	-1	0.223138	0	-1.493506	-1	0.493506	0	-0.582509	-1	-0.417491	0
TR 177	531	-1	-0.909173	-1	-0.090827	0	-0.904881	-1	-0.095119	0	-0.798203	-1	-0.201797	0	-0.968781	-1	-0.031219	0	-0.763715	-1	-0.236285	0	0.150008	0	-1.150008	-1
TR 178	441	1	0.944360	1	0.055640	0	0.933187	1	0.066813	0	0.573993	1	0.426007	0	0.875946	1	0.124054	0	0.682250	1	0.317750	0	0.205956	0	0.794044	1
TR 179	498	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943072	1	0.056928	0	1.851507	2	-0.851507	-1	1.921991	2	-0.921991	-1	0.997410	1	0.002590	0
TR 180	57	1	0.944307	1	0.055693	0	0.939439	1	0.060561	0	0.205768	0	0.794232	1	0.304113	0	0.695887	1	0.211310	0	0.788690	1	0.148574	0	0.851426	1
TR 181	194	-1	-0.909173	-1	-0.090827	0	-0.898345	-1	-0.101655	0	-0.959032	-1	-0.040968	0	-0.604870	-1	-0.395130	0	-0.105938	0	-0.894062	-1	-0.747146	-1	-0.252854	0
TR 182	422	1	0.918668	1	0.081332	0	0.103125	0	0.896875	1	0.746479	1	0.253521	0	0.317471	0	0.682529	1	0.153629	0	0.846371	1	0.055237	0	0.944763	1
TR 183	226	1	0.866331	1	0.133669	0	0.828368	1	0.171632	0	0.916327	1	0.083673	0	0.398766	0	0.601234	1	0.090711	0	0.909289	1	0.402219	0	0.597781	1
TR 184	95	-1	-0.909173	-1	-0.090827	0	-0.904268	-1	-0.095732	0	-0.452270	0	-0.547730	-1	-0.081569	0	-0.918431	-1	-0.099811	0	-0.900189	-1	0.009676	0	-1.009676	-1
TR 185	160	1	0.944360	1	0.055640	0	0.974657	1	0.025343	0	0.943068	1	0.056932	0	0.780347	1	0.219653	0	0.874985	1	0.125015	0	0.887424	1	0.112576	0
TR 186	630	1	0.944350	1	0.055650	0	0.968814	1	0.031186	0	0.935843	1	0.064157	0	0.750742	1	0.249258	0	0.517245	1	0.482755	0	0.726500	1	0.273500	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF Output C	NN - Traditional + HF Output D	NN - Traditional + HF Error C	NN - Traditional + HF Error D	NN - Traditional Only Output C	NN - Traditional Only Output D	NN - Traditional Only Error C	NN - Traditional Only Error D	NN - HF Only Output C	NN - HF Only Output D	NN - HF Only Error C	NN - HF Only Error D	LR - Traditional + HF Output C	LR - Traditional + HF Output D	LR - Traditional + HF Error C	LR - Traditional + HF Error D	LR - Traditional Only Output C	LR - Traditional Only Output D	LR - Traditional Only Error C	LR - Traditional Only Error D	LR - HF Only Output C	LR - HF Only Output D	LR - HF Only Error C	LR - HF Only Error D
TR 187	539	1	0.944331	1	0.055669	0	0.966456	1	0.033544	0	0.663103	1	0.336897	0	0.756510	1	0.243490	0	0.505784	1	0.494216	0	0.404771	0	0.595229	1
TR 188	205	-1	-0.909173	-1	-0.090827	0	-0.902951	-1	-0.097049	0	-0.959111	-1	-0.040889	0	-0.862013	-1	-0.137987	0	-0.515065	-1	-0.484935	0	-0.493794	0	-0.506206	-1
TR 189	4	-1	-0.909173	-1	-0.090827	0	-0.904911	-1	-0.095089	0	-0.960821	-1	-0.039179	0	-2.089727	-2	1.089727	1	-1.574216	-2	0.574216	1	-1.243881	-1	0.243881	0
TR 190	660	0	-0.909172	-1	0.909172	1	0.255635	0	-0.255635	0	0.557842	1	-0.557842	-1	0.042799	0	-0.042799	0	-0.161331	0	0.161331	0	0.108549	0	-0.108549	0
TR 191	407	1	0.944360	1	0.055640	0	0.974343	1	0.025657	0	0.573993	1	0.426007	0	0.910040	1	0.089960	0	0.862787	1	0.137213	0	0.205956	0	0.794044	1
TR 192	382	1	0.944359	1	0.055641	0	0.968551	1	0.031449	0	0.937415	1	0.062585	0	0.813362	1	0.186638	0	0.919320	1	0.080680	0	0.464414	0	0.535586	1
TR 193	27	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943080	1	0.056920	0	1.161133	1	-0.161133	0	1.438711	1	-0.438711	0	1.075522	1	-0.075522	0
TR 194	98	-1	-0.909173	-1	-0.090827	0	-0.904957	-1	-0.095043	0	0.556999	1	-1.556999	-2	-0.862683	-1	-0.137317	0	-0.904402	-1	-0.095598	0	0.394044	0	-1.394044	-1
TR 195	70	1	0.944360	1	0.055640	0	0.974676	1	0.025324	0	0.943141	1	0.056859	0	0.764636	1	0.235364	0	0.749685	1	0.250315	0	1.039738	1	-0.039738	0
TR 196	608	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960911	-1	-0.039089	0	-1.153232	-1	0.153232	0	-1.240011	-1	0.240011	0	-0.871402	-1	-0.128598	0
TR 197	514	1	0.944360	1	0.055640	0	0.958220	1	0.041780	0	0.014174	0	0.985826	1	0.686047	1	0.313953	0	0.688768	1	0.311232	0	0.655198	1	0.344802	0
TR 198	244	1	0.944360	1	0.055640	0	0.973632	1	0.026368	0	0.943143	1	0.056857	0	0.738691	1	0.261309	0	0.312379	0	0.687621	1	0.925736	1	0.074264	0
TR 199	557	1	0.944360	1	0.055640	0	0.971760	1	0.028240	0	0.943123	1	0.056877	0	0.815977	1	0.184023	0	0.799127	1	0.200873	0	1.053154	1	-0.053154	0
TR 200	237	-1	-0.909173	-1	-0.090827	0	-0.900885	-1	-0.099115	0	-0.960568	-1	-0.039432	0	-0.869353	-1	-0.130647	0	-0.078244	0	-0.921756	-1	-1.212188	-1	0.212188	0
TR 201	639	-1	-0.909171	-1	-0.090829	0	-0.898708	-1	-0.101292	0	-0.178671	0	-0.821329	-1	0.020045	0	-1.020045	-1	-0.093495	0	-0.906505	-1	0.470306	0	-1.470306	-1
TR 202	499	1	0.944360	1	0.055640	0	0.974652	1	0.025348	0	0.937558	1	0.062442	0	1.144617	1	-0.144617	0	1.244366	1	-0.244366	0	0.674401	1	0.325599	0
TR 203	314	1	0.941923	1	0.058077	0	-0.131604	0	1.131604	1	0.930049	1	0.069951	0	0.129863	0	0.870137	1	-0.209608	0	1.209608	1	0.228007	0	0.771993	1
TR 204	246	-1	-0.909173	-1	-0.090827	0	-0.899288	-1	-0.100712	0	-0.960261	-1	-0.039739	0	-0.836666	-1	-0.163334	0	-0.414205	0	-0.585795	-1	-0.844476	-1	-0.155524	0
TR 205	79	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.936237	1	0.063763	0	0.389586	0	0.610414	1	0.794041	1	0.205959	0	0.382639	0	0.617361	1
TR 206	230	1	0.944360	1	0.055640	0	0.968592	1	0.031408	0	0.943118	1	0.056882	0	0.833808	1	0.166192	0	0.441993	0	0.558007	1	1.169667	1	-0.169667	0
TR 207	284	-1	-0.909173	-1	-0.090827	0	-0.904122	-1	-0.095878	0	-0.251436	0	-0.748564	-1	-0.481526	0	-0.518474	-1	-0.955548	-1	-0.044452	0	0.089667	0	-1.089667	-1
TR 208	452	-1	-0.909173	-1	-0.090827	0	-0.904503	-1	-0.095497	0	0.107411	0	-1.107411	-1	-0.354654	0	-0.645346	-1	-0.325398	0	-0.674602	-1	0.234377	0	-1.234377	-1
TR 209	341	1	0.934541	1	0.065459	0	0.931036	1	0.068964	0	0.787791	1	0.212209	0	0.421208	0	0.578792	1	0.315551	0	0.684449	1	0.396743	0	0.603257	1
TR 210	214	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943093	1	0.056907	0	1.134346	1	-0.134346	0	1.019566	1	-0.019566	0	1.086927	1	-0.086927	0
TR 211	424	-1	-0.909173	-1	-0.090827	0	-0.904875	-1	-0.095125	0	0.235845	0	-1.235845	-1	-0.489230	0	-0.510770	-1	-0.589971	-1	-0.410029	0	-0.009097	0	-0.990903	-1
TR 212	103	1	0.944360	1	0.055640	0	0.974201	1	0.025799	0	0.943134	1	0.056866	0	0.673480	1	0.326520	0	0.591816	1	0.408184	0	0.997563	1	0.002437	0
TR 213	374	0	0.120858	0	-0.120858	0	-0.022017	0	0.022017	0	0.686052	1	-0.686052	-1	0.378838	0	-0.378838	0	0.239915	0	-0.239915	0	0.957134	1	-0.957134	-1
TR 214	339	0	0.094285	0	-0.094285	0	-0.382801	0	0.382801	0	-0.311766	0	0.311766	0	0.634370	1	-0.634370	-1	0.224486	0	-0.224486	0	0.336402	0	-0.336402	0
TR 215	633	1	0.944360	1	0.055640	0	0.973457	1	0.026543	0	0.467125	0	0.532875	1	0.307035	0	0.692965	1	0.776404	1	0.223596	0	0.414535	0	0.585465	1
TR 216	203	-1	-0.909173	-1	-0.090827	0	-0.885724	-1	-0.114276	0	-0.959111	-1	-0.040889	0	-0.383661	0	-0.616339	-1	-0.445917	0	-0.554083	-1	-0.493794	0	-0.506206	-1
TR 217	433	-1	-0.909173	-1	-0.090827	0	-0.904967	-1	-0.095033	0	-0.798203	-1	-0.201797	0	-1.027410	-1	0.027410	0	-1.025943	-1	0.025943	0	0.150008	0	-1.150008	-1
TR 218	40	1	0.944360	1	0.055640	0	0.974535	1	0.025465	0	0.943078	1	0.056922	0	1.398785	1	-0.398785	0	1.023121	1	-0.023121	0	0.952634	1	0.047366	0
TR 219	351	-1	-0.909173	-1	-0.090827	0	-0.904902	-1	-0.095098	0	-0.251436	0	-0.748564	-1	-0.850752	-1	-0.149248	0	-0.660975	-1	-0.339025	0	0.089667	0	-1.089667	-1
TR 220	641	1	0.944360	1	0.055640	0	0.974403	1	0.025597	0	0.905124	1	0.094876	0	0.770877	1	0.229123	0	0.684644	1	0.315356	0	0.512503	1	0.487497	0
TR 221	456	1	0.944360	1	0.055640	0	0.974080	1	0.025920	0	0.774106	1	0.225894	0	0.940361	1	0.059639	0	0.780343	1	0.219657	0	0.190656	0	0.809344	1
TR 222	446	1	0.944360	1	0.055640	0	0.974548	1	0.025452	0	-0.251436	0	1.251436	1	0.896168	1	0.103832	0	1.031424	1	-0.031424	0	0.089667	0	0.910333	1
TR 223	274	-1	-0.909173	-1	-0.090827	0	-0.214705	0	-0.785295	-1	-0.959483	-1	-0.040517	0	-0.360142	0	-0.639858	-1	0.122193	0	-1.122193	-1	-0.731961	-1	-0.268039	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 224	485	-1	0.853443	1	-1.853443	-2	-0.274452	0	-0.725548	-1	0.679692	1	-1.679692	-2	0.037870	0	-1.037870	-1	0.042455	0	-1.042455	-1	0.094965	0	-1.094965	-1
TR 225	316	0	-0.341614	0	0.341614	0	0.912055	1	-0.912055	-1	0.174019	0	-0.174019	0	0.388223	0	-0.388223	0	0.440964	0	-0.440964	0	0.513631	1	-0.513631	-1
TR 226	114	1	0.944079	1	0.055921	0	0.949634	1	0.050366	0	0.905018	1	0.094982	0	0.497756	0	0.502244	1	-0.025284	0	1.025284	1	0.243180	0	0.756820	1
TR 227	62	1	0.944360	1	0.055640	0	0.974676	1	0.025324	0	0.942998	1	0.057002	0	1.224938	1	-0.224938	0	1.363775	1	-0.363775	0	0.714271	1	0.285729	0
TR 228	483	1	0.932761	1	0.067239	0	0.087648	0	0.912352	1	0.774381	1	0.225619	0	0.410972	0	0.589028	1	0.275585	0	0.724415	1	0.113360	0	0.886640	1
TR 229	537	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.939145	1	0.060855	0	1.108307	1	-0.108307	0	1.091449	1	-0.091449	0	0.424529	0	0.575471	1
TR 230	554	1	0.944360	1	0.055640	0	0.974669	1	0.025331	0	0.942664	1	0.057336	0	0.715860	1	0.284140	0	0.909091	1	0.090909	0	0.834581	1	0.165419	0
TR 231	627	1	0.944360	1	0.055640	0	0.974472	1	0.025528	0	0.935843	1	0.064157	0	0.851000	1	0.149000	0	0.553035	1	0.446965	0	0.726500	1	0.273500	0
TR 232	480	1	0.944360	1	0.055640	0	0.969238	1	0.030762	0	0.663103	1	0.336897	0	0.975680	1	0.024320	0	0.535753	1	0.464247	0	0.404771	0	0.595229	1
TR 233	400	1	0.944360	1	0.055640	0	0.937332	1	0.062668	0	0.107411	0	0.892589	1	0.941279	1	0.058721	0	0.723626	1	0.276374	0	0.234377	0	0.765623	1
TR 234	64	1	0.944360	1	0.055640	0	0.884171	1	0.115829	0	0.943090	1	0.056910	0	0.618604	1	0.381396	0	0.145133	0	0.854867	1	0.809448	1	0.190552	0
TR 235	87	0	-0.909173	-1	0.909173	1	-0.116441	0	0.116441	0	-0.960821	-1	0.960821	1	-0.822778	-1	0.822778	1	0.113836	0	-0.113836	0	-1.243881	-1	1.243881	1
TR 236	221	1	0.942729	1	0.057271	0	0.207952	0	0.792048	1	0.741229	1	0.258771	0	0.167096	0	0.832904	1	0.065255	0	0.934745	1	0.207390	0	0.792610	1
TR 237	112	1	0.944360	1	0.055640	0	0.974350	1	0.025650	0	-0.251436	0	1.251436	1	0.464705	0	0.535295	1	0.539287	1	0.460713	0	0.089667	0	0.910333	1
TR 238	522	1	0.944360	1	0.055640	0	0.974578	1	0.025422	0	0.789197	1	0.210803	0	1.396390	1	-0.396390	0	0.898689	1	0.101311	0	0.462153	0	0.537847	1
TR 239	427	-1	-0.909173	-1	-0.090827	0	-0.878185	-1	-0.121815	0	-0.312099	0	-0.687901	-1	-0.641746	-1	-0.358254	0	-0.345336	0	-0.654664	-1	-0.094901	0	-0.905099	-1
TR 240	59	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.943090	1	0.056910	0	1.281011	1	-0.281011	0	1.103841	1	-0.103841	0	0.809448	1	0.190552	0
TR 241	603	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.956030	-1	-0.043970	0	-1.361932	-1	0.361932	0	-1.628988	-2	0.628988	1	-0.281262	0	-0.718738	-1
TR 242	315	1	0.944360	1	0.055640	0	0.974673	1	0.025327	0	0.573993	1	0.426007	0	0.797557	1	0.202443	0	0.962320	1	0.037680	0	0.205956	0	0.794044	1
TR 243	474	1	-0.909124	-1	1.909124	2	-0.081101	0	1.081101	1	0.670225	1	0.329775	0	0.073327	0	0.926673	1	0.315101	0	0.684899	1	-0.162910	0	1.162910	1
TR 244	76	-1	-0.906188	-1	-0.093812	0	-0.901897	-1	-0.098103	0	-0.791923	-1	-0.208077	0	-0.323645	0	-0.676355	-1	-0.273735	0	-0.726265	-1	-0.171450	0	-0.828550	-1
TR 245	518	1	0.944360	1	0.055640	0	0.972649	1	0.027351	0	-0.117491	0	1.117491	1	0.797336	1	0.202664	0	0.782669	1	0.217331	0	0.111718	0	0.888282	1
TR 246	544	0	-0.443093	0	0.443093	0	-0.204784	0	0.204784	0	0.205768	0	-0.205768	0	0.147951	0	-0.147951	0	0.122812	0	-0.122812	0	0.148574	0	-0.148574	0
TR 247	60	1	0.944360	1	0.055640	0	0.974219	1	0.025781	0	0.943090	1	0.056910	0	0.990199	1	0.009801	0	0.597350	1	0.402650	0	0.809448	1	0.190552	0
TR 248	371	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.923242	1	0.076758	0	1.198586	1	-0.198586	0	0.966945	1	0.033055	0	0.591279	1	0.408721	0
TR 249	195	0	0.071113	0	-0.071113	0	0.280781	0	-0.280781	0	-0.047277	0	0.047277	0	0.163416	0	-0.163416	0	0.317981	0	-0.317981	0	0.036059	0	-0.036059	0
TR 250	412	1	0.944333	1	0.055667	0	0.967711	1	0.032289	0	0.713918	1	0.286082	0	0.614728	1	0.385272	0	0.713865	1	0.286135	0	0.036842	0	0.963158	1
TR 251	612	-1	-0.909173	-1	-0.090827	0	-0.821936	-1	-0.178064	0	0.205768	0	-1.205768	-1	-0.878815	-1	-0.121185	0	-0.665635	-1	-0.334365	0	0.148574	0	-1.148574	-1
TR 252	66	1	0.944359	1	0.055641	0	0.966002	1	0.033998	0	0.941523	1	0.058477	0	0.499702	0	0.500298	1	0.223027	0	0.776973	1	0.647568	1	0.352432	0
TR 253	271	0	0.942087	1	-0.942087	-1	-0.018466	0	0.018466	0	-0.251436	0	0.251436	0	-0.004219	0	0.004219	0	0.081230	0	-0.081230	0	0.089667	0	-0.089667	0
TR 254	438	1	0.944360	1	0.055640	0	0.974399	1	0.025601	0	0.205768	0	0.794232	1	1.211245	1	-0.211245	0	1.196178	1	-0.196178	0	0.148574	0	0.851426	1
TR 255	511	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943120	1	0.056880	0	1.600809	2	-0.600809	-1	1.555081	2	-0.555081	-1	1.160689	1	-0.160689	0
TR 256	429	1	0.943636	1	0.056364	0	0.941490	1	0.058510	0	0.235845	0	0.764155	1	0.263472	0	0.736528	1	0.374722	0	0.625278	1	-0.009097	0	1.009097	1
TR 257	361	1	0.944360	1	0.055640	0	0.970766	1	0.029234	0	0.938750	1	0.061250	0	0.621759	1	0.378241	0	0.617636	1	0.382364	0	0.616567	1	0.383433	0
TR 258	634	1	0.881042	1	0.118958	0	-0.629550	-1	1.629550	2	0.467125	0	0.532875	1	-0.657400	-1	1.657400	2	-0.202990	0	1.202990	1	0.414535	0	0.585465	1
TR 259	611	-1	-0.909173	-1	-0.090827	0	-0.890288	-1	-0.109712	0	-0.058186	0	-0.941814	-1	-0.461020	0	-0.538980	-1	-0.357775	0	-0.642225	-1	0.359535	0	-1.359535	-1
TR 260	406	1	0.944360	1	0.055640	0	0.972677	1	0.027323	0	0.905137	1	0.094863	0	0.645315	1	0.354685	0	0.655296	1	0.344704	0	0.163759	0	0.836241	1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 261	48	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943170	1	0.056830	0	1.216347	1	-0.216347	0	1.114882	1	-0.114882	0	1.207301	1	-0.207301	0
TR 262	223	1	0.944360	1	0.055640	0	0.966109	1	0.033891	0	0.943090	1	0.056910	0	0.744229	1	0.255771	0	0.463187	0	0.536813	1	0.809448	1	0.190552	0
TR 263	389	1	0.944360	1	0.055640	0	0.911189	1	0.088811	0	0.717204	1	0.282796	0	0.428792	0	0.571208	1	0.584848	1	0.415152	0	0.109756	0	0.890244	1
TR 264	342	1	0.944359	1	0.055641	0	0.969150	1	0.030850	0	0.804087	1	0.195913	0	0.986470	1	0.013530	0	0.493424	0	0.506576	1	0.592600	1	0.407400	0
TR 265	459	-1	-0.909173	-1	-0.090827	0	-0.904956	-1	-0.095044	0	-0.886071	-1	-0.113929	0	-0.419220	0	-0.580780	-1	-0.514299	-1	-0.485701	0	-0.348161	0	-0.651839	-1
TR 266	582	1	0.944360	1	0.055640	0	0.974672	1	0.025328	0	0.942797	1	0.057203	0	0.847800	1	0.152200	0	1.283405	1	-0.283405	0	0.806497	1	0.193503	0
TR 267	104	1	0.941711	1	0.058289	0	0.798003	1	0.201997	0	-0.693092	-1	1.693092	2	0.193397	0	0.806603	1	0.070315	0	0.929685	1	-1.204043	-1	2.204043	2
TR 268	187	-1	-0.909159	-1	-0.090841	0	-0.893082	-1	-0.106918	0	0.205768	0	-1.205768	-1	-0.011540	0	-0.988460	-1	-0.122361	0	-0.877639	-1	0.148574	0	-1.148574	-1
TR 269	247	1	0.944360	1	0.055640	0	0.974624	1	0.025376	0	0.943103	1	0.056897	0	0.804250	1	0.195750	0	0.665652	1	0.334348	0	0.824633	1	0.175367	0
TR 270	653	1	0.944360	1	0.055640	0	0.974658	1	0.025342	0	0.243560	0	0.756440	1	1.215196	1	-0.215196	0	1.279409	1	-0.279409	0	0.870872	1	0.129128	0
TR 271	577	1	0.764172	1	0.235828	0	-0.896412	-1	1.896412	2	0.942800	1	0.057200	0	0.334497	0	0.665503	1	-0.006765	0	1.006765	1	1.012416	1	-0.012416	0
TR 272	606	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960911	-1	-0.039089	0	-1.060550	-1	0.060550	0	-1.179689	-1	0.179689	0	-0.871402	-1	-0.128598	0
TR 273	561	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960880	-1	-0.039120	0	-1.151246	-1	0.151246	0	-1.710220	-2	0.710220	1	-0.793568	-1	-0.206432	0
TR 274	336	0	-0.028410	0	0.028410	0	-0.903098	-1	0.903098	1	-0.311766	0	0.311766	0	-0.008414	0	0.008414	0	-0.516700	-1	0.516700	1	0.336402	0	-0.336402	0
TR 275	372	0	-0.304552	0	0.304552	0	-0.644269	-1	0.644269	1	0.556999	1	-0.556999	-1	0.079846	0	-0.079846	0	-0.210902	0	0.210902	0	0.394044	0	-0.394044	0
TR 276	228	1	0.943402	1	0.056598	0	0.974519	1	0.025481	0	0.934484	1	0.065516	0	0.668307	1	0.331693	0	0.529748	1	0.470252	0	0.495490	0	0.504510	1
TR 277	234	-1	-0.909173	-1	-0.090827	0	-0.904956	-1	-0.095044	0	-0.959944	-1	-0.040056	0	-0.878924	-1	-0.121076	0	-1.081563	-1	0.081563	0	-0.683013	-1	-0.316987	0
TR 278	97	1	0.944360	1	0.055640	0	0.974609	1	0.025391	0	0.556999	1	0.443001	0	0.968308	1	0.031692	0	1.022306	1	-0.022306	0	0.394044	0	0.605956	1
TR 279	354	1	0.944360	1	0.055640	0	0.974496	1	0.025504	0	0.853696	1	0.146304	0	0.574680	1	0.425320	0	0.798305	1	0.201695	0	0.564438	1	0.435562	0
TR 280	106	1	0.944360	1	0.055640	0	0.972520	1	0.027480	0	0.943090	1	0.056910	0	0.794790	1	0.205210	0	0.457764	0	0.542236	1	0.809448	1	0.190552	0
TR 281	533	1	0.943862	1	0.056138	0	0.948018	1	0.051982	0	0.409952	0	0.590048	1	0.340797	0	0.659203	1	0.483488	0	0.516512	1	0.188006	0	0.811994	1
TR 282	650	-1	-0.909173	-1	-0.090827	0	-0.866953	-1	-0.133047	0	-0.077336	0	-0.922664	-1	-0.009736	0	-0.990264	-1	0.260880	0	-1.260880	-1	0.492357	0	-1.492357	-1
TR 283	8	-1	-0.909173	-1	-0.090827	0	-0.901965	-1	-0.098035	0	-0.639904	-1	-0.360096	0	-0.000214	0	-0.999786	-1	-0.431506	0	-0.568494	-1	0.564819	1	-1.564819	-2
TR 284	431	-1	-0.909173	-1	-0.090827	0	-0.885928	-1	-0.114072	0	0.255573	0	-1.255573	-1	-0.354607	0	-0.645393	-1	-0.322372	0	-0.677628	-1	0.104852	0	-1.104852	-1
TR 285	591	1	0.944360	1	0.055640	0	0.888447	1	0.111553	0	0.941140	1	0.058860	0	1.109374	1	-0.109374	0	0.817998	1	0.182002	0	0.898830	1	0.101170	0
TR 286	202	-1	-0.909173	-1	-0.090827	0	-0.853501	-1	-0.146499	0	-0.953592	-1	-0.046408	0	-0.536515	-1	-0.463485	0	-0.245503	0	-0.754497	-1	-0.136365	0	-0.863635	-1
TR 287	15	1	0.944359	1	0.055641	0	0.719100	1	0.280900	0	0.943162	1	0.056838	0	1.099019	1	-0.099019	0	0.312248	0	0.687752	1	1.168152	1	-0.168152	0
TR 288	440	1	0.944360	1	0.055640	0	0.974434	1	0.025566	0	0.573993	1	0.426007	0	1.083297	1	-0.083297	0	0.972213	1	0.027787	0	0.205956	0	0.794044	1
TR 289	287	-1	-0.909173	-1	-0.090827	0	-0.904904	-1	-0.095096	0	-0.959400	-1	-0.040600	0	-1.141800	-1	0.141800	0	-1.400950	-1	0.400950	0	-0.748671	-1	-0.251329	0
TR 290	46	1	0.944360	1	0.055640	0	0.936087	1	0.063913	0	0.943120	1	0.056880	0	0.726341	1	0.273659	0	0.186642	0	0.813358	1	0.868354	1	0.131646	0
TR 291	267	1	0.944360	1	0.055640	0	0.750344	1	0.249656	0	0.942573	1	0.057427	0	0.803277	1	0.196723	0	0.052675	0	0.947325	1	0.771506	1	0.228494	0
TR 292	155	-1	-0.909173	-1	-0.090827	0	-0.904963	-1	-0.095037	0	-0.959032	-1	-0.040968	0	-0.974936	-1	-0.025064	0	-0.491071	0	-0.508929	-1	-0.747146	-1	-0.252854	0
TR 293	646	1	0.944152	1	0.055848	0	0.729508	1	0.270492	0	0.921345	1	0.078655	0	0.213748	0	0.786252	1	0.032940	0	0.967060	1	0.374553	0	0.625447	1
TR 294	629	1	0.944360	1	0.055640	0	0.974603	1	0.025397	0	0.935843	1	0.064157	0	0.872266	1	0.127734	0	1.018696	1	-0.018696	0	0.726500	1	0.273500	0
TR 295	530	1	0.944352	1	0.055648	0	0.871158	1	0.128842	0	0.409952	0	0.590048	1	-0.493339	0	1.493339	1	-0.214159	0	1.214159	1	0.188006	0	0.811994	1
TR 296	21	1	0.944360	1	0.055640	0	0.925621	1	0.074379	0	0.942975	1	0.057025	0	0.689142	1	0.310858	0	0.374024	0	0.625976	1	0.830801	1	0.169199	0
TR 297	171	-1	-0.909173	-1	-0.090827	0	-0.904902	-1	-0.095098	0	-0.959032	-1	-0.040968	0	-1.399147	-1	0.399147	0	-1.033758	-1	0.033758	0	-0.747146	-1	-0.252854	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 298	644	1	0.943929	1	0.056071	0	0.971697	1	0.028303	0	0.903365	1	0.096635	0	0.525826	1	0.474174	0	0.203716	0	0.796284	1	0.435699	0	0.564301	1
TR 299	58	-1	-0.909173	-1	-0.090827	0	-0.902014	-1	-0.097986	0	-0.923827	-1	-0.076173	0	-0.879889	-1	-0.120111	0	-0.391477	0	-0.608523	-1	-0.806053	-1	-0.193947	0
TR 300	387	1	0.944360	1	0.055640	0	0.974574	1	0.025426	0	0.859331	1	0.140669	0	0.895828	1	0.104172	0	0.946168	1	0.053832	0	0.390113	0	0.609887	1
TR 301	397	-1	-0.909173	-1	-0.090827	0	-0.901025	-1	-0.098975	0	-0.854832	-1	-0.145168	0	-0.681067	-1	-0.318933	0	-0.329887	0	-0.670113	-1	-0.294659	0	-0.705341	-1
TR 302	655	0	0.944360	1	-0.944360	-1	-0.523564	-1	0.523564	1	0.797698	1	-0.797698	-1	0.269251	0	-0.269251	0	0.089072	0	-0.089072	0	0.416750	0	-0.416750	0
TR 303	555	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.941448	1	0.058552	0	1.891774	2	-0.891774	-1	2.079312	2	-1.079312	-1	0.839485	1	0.160515	0
TR 304	169	1	0.944360	1	0.055640	0	0.974591	1	0.025409	0	0.943085	1	0.056915	0	0.879191	1	0.120809	0	0.806771	1	0.193229	0	1.018917	1	-0.018917	0
TR 305	367	1	0.944360	1	0.055640	0	0.974574	1	0.025426	0	0.556999	1	0.443001	0	0.593284	1	0.406716	0	0.749677	1	0.250323	0	0.394044	0	0.605956	1
TR 306	597	1	0.944360	1	0.055640	0	0.974567	1	0.025433	0	0.943139	1	0.056861	0	1.132238	1	-0.132238	0	0.679907	1	0.320093	0	1.527033	2	-0.527033	-1
TR 307	436	1	0.944360	1	0.055640	0	0.752931	1	0.247069	0	0.930049	1	0.069951	0	0.538317	1	0.461683	0	0.303489	0	0.696511	1	0.228007	0	0.771993	1
TR 308	423	1	0.944360	1	0.055640	0	0.932729	1	0.067271	0	0.935672	1	0.064328	0	0.650781	1	0.349219	0	0.331749	0	0.668251	1	0.212009	0	0.787991	1
TR 309	243	1	0.944345	1	0.055655	0	-0.899055	-1	1.899055	2	0.943163	1	0.056837	0	0.775685	1	0.224315	0	0.057780	0	0.942220	1	1.274175	1	-0.274175	0
TR 310	168	1	0.944320	1	0.055680	0	0.861163	1	0.138837	0	0.806961	1	0.193039	0	0.457193	0	0.542807	1	0.470126	0	0.529874	1	0.244326	0	0.755674	1
TR 311	310	-1	-0.909173	-1	-0.090827	0	-0.903987	-1	-0.096013	0	-0.960478	-1	-0.039522	0	-0.428966	0	-0.571034	-1	-0.507899	-1	-0.492101	0	-0.434888	0	-0.565112	-1
TR 312	507	1	0.944360	1	0.055640	0	0.582030	1	0.417970	0	0.942137	1	0.057863	0	0.681488	1	0.318502	0	0.390299	0	0.609701	1	0.520660	1	0.479340	0
TR 313	399	-1	-0.909173	-1	-0.090827	0	-0.904887	-1	-0.095113	0	-0.551001	-1	-0.448999	0	-0.548814	-1	-0.451186	0	-0.495935	0	-0.504065	-1	0.009718	0	-1.009718	-1
TR 314	454	0	-0.100966	0	0.100966	0	0.436545	0	-0.436545	0	-0.248081	0	0.248081	0	0.405133	0	-0.405133	0	0.492144	0	-0.492144	0	0.258429	0	-0.258429	0
TR 315	347	1	0.944358	1	0.055642	0	0.959815	1	0.040185	0	0.556999	1	0.443001	0	0.608552	1	0.391448	0	0.605754	1	0.394246	0	0.394044	0	0.605956	1
TR 316	492	1	0.944360	1	0.055640	0	0.974668	1	0.025332	0	0.939976	1	0.060024	0	0.647528	1	0.352472	0	0.831370	1	0.168630	0	0.404049	0	0.595951	1
TR 317	39	-1	-0.909173	-1	-0.090827	0	-0.904294	-1	-0.095706	0	-0.930105	-1	-0.069895	0	-0.355921	0	-0.644079	-1	-0.277639	0	-0.722361	-1	-0.353186	0	-0.646814	-1
TR 318	224	1	0.944360	1	0.055640	0	0.968988	1	0.031012	0	0.943120	1	0.056880	0	0.885679	1	0.114321	0	0.527081	1	0.472919	0	0.868354	1	0.131646	0
TR 319	502	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.942282	1	0.057718	0	0.922810	1	0.077190	0	0.988584	1	0.011416	0	0.979952	1	0.020048	0
TR 320	83	-1	-0.786726	-1	-0.213274	0	-0.764515	-1	-0.235485	0	0.765469	1	-1.765469	-2	-0.135149	0	-0.864851	-1	-0.398792	0	-0.601208	-1	0.076257	0	-1.076257	-1
TR 321	609	-1	-0.909112	-1	-0.090888	0	0.116205	0	-1.116205	-1	-0.058186	0	-0.941814	-1	-0.125716	0	-0.874284	-1	0.057692	0	-1.057692	-1	0.359535	0	-1.359535	-1
TR 322	500	1	0.944360	1	0.055640	0	0.973719	1	0.026281	0	0.717854	1	0.282146	0	0.759629	1	0.240371	0	0.777497	1	0.222503	0	0.266668	0	0.733332	1
TR 323	588	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.959020	-1	-0.040980	0	-0.599928	-1	-0.400072	0	-0.728592	-1	-0.271408	0	-0.486157	0	-0.513843	-1
TR 324	513	0	0.136074	0	-0.136074	0	-0.282455	0	0.282455	0	0.014174	0	-0.014174	0	0.010406	0	-0.010406	0	-0.123517	0	0.123517	0	0.655198	1	-0.655198	-1
TR 325	443	0	0.172800	0	-0.172800	0	0.022222	0	-0.022222	0	0.401019	0	-0.401019	0	0.131299	0	-0.131299	0	0.270071	0	-0.270071	0	0.224099	0	-0.224099	0
TR 326	451	-1	-0.909173	-1	-0.090827	0	-0.904832	-1	-0.095168	0	0.205768	0	-1.205768	-1	-0.425473	0	-0.574527	-1	-0.374966	0	-0.625034	-1	0.148574	0	-1.148574	-1
TR 327	484	0	0.944330	1	-0.944330	-1	0.968741	1	-0.968741	-1	0.679692	1	-0.679692	-1	0.509670	1	-0.509670	-1	0.842218	1	-0.842218	-1	0.094965	0	-0.094965	0
TR 328	365	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.936779	1	0.063221	0	0.997538	1	0.002462	0	1.279977	1	-0.279977	0	0.415397	0	0.584603	1
TR 329	460	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	-0.251436	0	1.251436	1	1.374436	1	-0.374436	0	1.647065	2	-0.647065	-1	0.089667	0	0.910333	1
TR 330	410	1	0.944360	1	0.055640	0	0.973920	1	0.026080	0	-0.725408	-1	1.725408	2	0.607234	1	0.392766	0	0.851207	1	0.148793	0	-0.033776	0	1.033776	1
TR 331	108	1	0.944349	1	0.055651	0	0.973709	1	0.026291	0	0.938641	1	0.061359	0	0.521565	1	0.478435	0	0.381493	0	0.618507	1	0.640516	1	0.359484	0
TR 332	515	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943056	1	0.056944	0	0.564226	1	0.435774	0	0.649404	1	0.350596	0	0.714623	1	0.285377	0
TR 333	394	1	0.944360	1	0.055640	0	0.926134	1	0.073866	0	0.941713	1	0.058287	0	0.522041	1	0.477959	0	0.376650	0	0.623350	1	0.467008	0	0.532992	1
TR 334	177	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	0.938286	1	-1.938286	-2	-0.872599	-1	-0.127401	0	-1.276033	-1	0.276033	0	0.371620	0	-1.371620	-1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 335	551	1	0.944360	1	0.055640	0	0.974193	1	0.025807	0	0.941786	1	0.058214	0	0.618853	1	0.381147	0	0.336035	0	0.663965	1	0.876778	1	0.123222	0
TR 336	6	-1	-0.909173	-1	-0.090827	0	-0.894916	-1	-0.105084	0	-0.923827	-1	-0.076173	0	-0.848464	-1	-0.151536	0	-0.338680	0	-0.661320	-1	-0.806053	-1	-0.193947	0
TR 337	620	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.942841	1	0.057159	0	0.857297	1	0.142703	0	1.116789	1	-0.116789	0	1.093803	1	-0.093803	0
TR 338	80	-1	-0.909173	-1	-0.090827	0	-0.901159	-1	-0.098841	0	-0.923827	-1	-0.076173	0	-1.014146	-1	0.014146	0	-0.454500	0	-0.545500	-1	-0.806053	-1	-0.193947	0
TR 339	266	1	0.944360	1	0.055640	0	0.972090	1	0.027910	0	0.255573	0	0.744427	1	0.403680	0	0.596320	1	0.238007	0	0.761993	1	0.104852	0	0.895148	1
TR 340	380	1	0.944344	1	0.055656	0	0.969192	1	0.030808	0	0.686052	1	0.313948	0	0.614246	1	0.385754	0	0.418485	0	0.581515	1	0.957134	1	0.042866	0
TR 341	538	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.829988	1	0.170012	0	1.205558	1	-0.205558	0	1.660547	2	-0.660547	-1	0.062770	0	0.937230	1
TR 342	306	-1	-0.909173	-1	-0.090827	0	-0.904555	-1	-0.095445	0	-0.251436	0	-0.748564	-1	-0.430103	0	-0.569897	-1	-0.671739	-1	-0.328261	0	0.089667	0	-1.089667	-1
TR 343	152	1	0.944358	1	0.055642	0	0.973155	1	0.026845	0	0.573993	1	0.426007	0	0.547186	1	0.452814	0	0.561432	1	0.438568	0	0.205956	0	0.794044	1
TR 344	580	1	0.944360	1	0.055640	0	0.971851	1	0.028149	0	0.936869	1	0.063131	0	0.501223	1	0.498777	0	0.895086	1	0.104914	0	0.824300	1	0.175700	0
TR 345	370	1	0.944360	1	0.055640	0	0.974402	1	0.025598	0	0.556999	1	0.443001	0	0.765324	1	0.234676	0	0.936635	1	0.063365	0	0.394044	0	0.605956	1
TR 346	477	1	0.944360	1	0.055640	0	0.974587	1	0.025413	0	0.881778	1	0.118222	0	0.853642	1	0.146358	0	0.988996	1	0.011004	0	0.290822	0	0.709178	1
TR 347	648	1	0.944360	1	0.055640	0	0.864976	1	0.135024	0	0.931023	1	0.068977	0	0.488669	0	0.511331	1	0.298769	0	0.701231	1	0.396605	0	0.603395	1
TR 348	583	-1	-0.909140	-1	-0.090860	0	-0.723428	-1	-0.276572	0	-0.552380	-1	-0.447620	0	0.066699	0	-1.066699	-1	0.652038	1	-1.652038	-2	0.419940	0	-1.419940	-1
TR 349	602	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	-0.307184	0	1.307184	1	1.513325	2	-0.513325	-1	2.464511	2	-1.464511	-1	-0.474975	0	1.474975	1
TR 350	570	1	0.944360	1	0.055640	0	0.971811	1	0.028189	0	0.883994	1	0.116006	0	0.827943	1	0.172057	0	0.954146	1	0.045854	0	0.217328	0	0.782672	1
TR 351	386	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.500702	-1	-0.499298	0	-0.978808	-1	-0.021192	0	-1.216765	-1	0.216765	0	0.168663	0	-1.168663	-1
TR 352	581	1	0.944360	1	0.055640	0	0.974609	1	0.025391	0	0.936869	1	0.063131	0	0.978942	1	0.021058	0	1.054502	1	-0.054502	0	0.824300	1	0.175700	0
TR 353	115	-1	-0.909173	-1	-0.090827	0	-0.904959	-1	-0.095041	0	-0.779063	-1	-0.220937	0	-1.165785	-1	0.165785	0	-1.151288	-1	0.151288	0	-0.525696	-1	-0.474304	0
TR 354	408	1	0.944360	1	0.055640	0	0.974650	1	0.025350	0	0.205768	0	0.794232	1	0.890717	1	0.109283	0	1.118711	1	-0.118711	0	0.148574	0	0.851426	1
TR 355	391	-1	-0.909173	-1	-0.090827	0	-0.904969	-1	-0.095031	0	-0.960802	-1	-0.039198	0	-0.865859	-1	-0.134141	0	-0.772020	-1	-0.227980	0	-1.012522	-1	0.012522	0
TR 356	319	-1	-0.909173	-1	-0.090827	0	-0.174890	0	-0.825110	-1	-0.251436	0	-0.748564	-1	-0.686427	-1	-0.313573	0	-0.751899	-1	-0.248101	0	0.089667	0	-1.089667	-1
TR 357	245	-1	-0.909173	-1	-0.090827	0	-0.901950	-1	-0.098050	0	-0.948339	-1	-0.051661	0	-0.775895	-1	-0.224105	0	-0.797503	-1	-0.202497	0	-0.455853	0	-0.544147	-1
TR 358	323	1	0.944017	1	0.055983	0	0.941994	1	0.058006	0	0.930049	1	0.069951	0	0.617721	1	0.382279	0	0.340389	0	0.659611	1	0.228007	0	0.771993	1
TR 359	204	1	0.944360	1	0.055640	0	0.899258	1	0.100742	0	0.942782	1	0.057218	0	0.683418	1	0.316582	0	0.380397	0	0.619603	1	1.057904	1	-0.057904	0
TR 360	151	1	0.944360	1	0.055640	0	0.974609	1	0.025391	0	0.943090	1	0.056910	0	1.126966	1	-0.126966	0	1.070248	1	-0.070248	0	0.809448	1	0.190552	0
TR 361	482	0	-0.613452	-1	0.613452	1	-0.673870	-1	0.673870	1	0.670225	1	-0.670225	-1	0.022370	0	-0.022370	0	0.212725	0	-0.212725	0	-0.162910	0	0.162910	0
TR 362	54	1	0.944360	1	0.055640	0	0.974653	1	0.025347	0	0.942827	1	0.057173	0	0.384657	0	0.615343	1	0.501214	1	0.498786	0	0.425121	0	0.574879	1
TR 363	137	-1	-0.909173	-1	-0.090827	0	-0.904961	-1	-0.095039	0	-0.960821	-1	-0.039179	0	-2.063616	-2	1.063616	1	-1.695944	-2	0.695944	1	-1.243881	-1	0.243881	0
TR 364	241	1	0.930885	1	0.069115	0	0.738646	1	0.261354	0	0.387422	0	0.612578	1	-0.102443	0	1.102443	1	0.056619	0	0.943381	1	-0.136120	0	1.136120	1
TR 365	110	-1	-0.909173	-1	-0.090827	0	-0.904963	-1	-0.095037	0	-0.960461	-1	-0.039539	0	-1.135977	-1	0.135977	0	-0.980341	-1	-0.019659	0	-0.602445	-1	-0.397555	0
TR 366	383	1	0.944357	1	0.055643	0	0.940607	1	0.059393	0	0.885973	1	0.114027	0	0.502460	1	0.497540	0	0.768323	1	0.231677	0	0.503402	1	0.496598	0
TR 367	616	-1	-0.909173	-1	-0.090827	0	-0.904967	-1	-0.095033	0	-0.832075	-1	-0.167925	0	-0.994087	-1	-0.005913	0	-0.711961	-1	-0.288039	0	0.089367	0	-1.089367	-1
TR 368	65	1	0.944360	1	0.055640	0	0.965705	1	0.034295	0	0.943149	1	0.056851	0	0.809986	1	0.190014	0	0.465746	0	0.534254	1	1.056470	1	-0.056470	0
TR 369	193	0	-0.518259	-1	0.518259	1	0.640821	1	-0.640821	-1	-0.917121	-1	0.917121	1	0.082791	0	-0.082791	0	0.573404	1	-0.573404	-1	-0.720249	-1	0.720249	1
TR 370	337	1	0.944358	1	0.055642	0	0.970088	1	0.029912	0	0.335176	0	0.664824	1	0.728818	1	0.271182	0	0.419437	0	0.580563	1	0.709148	1	0.290852	0
TR 371	543	0	-0.012308	0	0.012308	0	-0.087325	0	0.087325	0	0.205768	0	-0.205768	0	0.170918	0	-0.170918	0	0.204658	0	-0.204658	0	0.148574	0	-0.148574	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 372	38	1	0.944360	1	0.055640	0	0.974629	1	0.025371	0	0.943090	1	0.056910	0	1.127842	1	-0.127842	0	1.157994	1	-0.157994	0	0.809448	1	0.190552	0
TR 373	28	1	0.944325	1	0.055675	0	0.974204	1	0.025796	0	0.943112	1	0.056888	0	0.695421	1	0.304579	0	0.672455	1	0.327545	0	0.782550	1	0.217450	0
TR 374	126	1	0.944360	1	0.055640	0	0.969387	1	0.030613	0	0.942931	1	0.057069	0	0.684052	1	0.315948	0	0.540440	1	0.459560	0	0.685703	1	0.314297	0
TR 375	352	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.853696	1	0.146304	0	1.137878	1	-0.137878	0	1.216630	1	-0.216630	0	0.564438	1	0.435562	0
TR 376	269	-1	-0.909137	-1	-0.090863	0	-0.861865	-1	-0.138135	0	0.205768	0	-1.205768	-1	-0.055538	0	-0.944462	-1	-0.002514	0	-0.997486	-1	0.148574	0	-1.148574	-1
TR 377	50	1	0.944360	1	0.055640	0	0.974300	1	0.025700	0	0.943139	1	0.056861	0	0.746920	1	0.253080	0	0.624869	1	0.375131	0	0.820094	1	0.179906	0
TR 378	574	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960559	-1	-0.039441	0	-0.845191	-1	-0.154809	0	-0.741372	-1	-0.258628	0	-0.619593	-1	-0.380407	0
TR 379	35	1	0.944360	1	0.055640	0	0.974185	1	0.025815	0	0.943090	1	0.056910	0	0.540286	1	0.459714	0	0.467694	0	0.532306	1	0.809448	1	0.190552	0
TR 380	43	1	0.944360	1	0.055640	0	0.973909	1	0.026091	0	0.943120	1	0.056880	0	0.857195	1	0.142805	0	0.584637	1	0.415363	0	0.868354	1	0.131646	0
TR 381	184	-1	-0.909172	-1	-0.090828	0	-0.844136	-1	-0.155864	0	-0.251436	0	-0.748564	-1	-0.067711	0	-0.932289	-1	-0.115505	0	-0.884495	-1	0.089667	0	-1.089667	-1
TR 382	273	1	0.944360	1	0.055640	0	0.974582	1	0.025418	0	0.942573	1	0.057427	0	1.064058	1	-0.064058	0	0.914660	1	0.085340	0	0.771506	1	0.228494	0
TR 383	411	1	0.709963	1	0.290037	0	0.947236	1	0.052764	0	0.713918	1	0.286082	0	0.213474	0	0.786526	1	0.202153	0	0.797847	1	0.036842	0	0.963158	1
TR 384	556	1	0.944360	1	0.055640	0	0.974676	1	0.025324	0	0.943089	1	0.056911	0	0.801608	1	0.198392	0	0.896457	1	0.103543	0	1.119842	1	-0.119842	0
TR 385	416	-1	-0.902084	-1	-0.097916	0	-0.902379	-1	-0.097621	0	-0.877017	-1	-0.122983	0	0.012498	0	-1.012498	-1	-0.088416	0	-0.911584	-1	0.033884	0	-1.033884	-1
TR 386	330	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.943136	1	0.056864	0	0.694014	1	0.305986	0	0.681368	1	0.318632	0	1.025491	1	-0.025491	0
TR 387	325	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.941475	1	0.058525	0	1.374036	1	-0.374036	0	0.675311	1	0.324689	0	0.808743	1	0.191257	0
TR 388	375	0	0.613820	1	-0.613820	-1	0.067778	0	-0.067778	0	0.686052	1	-0.686052	-1	0.163595	0	-0.163595	0	-0.062955	0	0.062955	0	0.957134	1	-0.957134	-1
TR 389	56	-1	-0.909173	-1	-0.090827	0	-0.521236	-1	-0.478764	0	-0.923827	-1	-0.076173	0	-0.396654	0	-0.603346	-1	0.225422	0	-1.225422	-1	-0.806053	-1	-0.193947	0
TR 390	176	-1	-0.909173	-1	-0.090827	0	-0.903942	-1	-0.096058	0	-0.960924	-1	-0.039076	0	-1.040787	-1	0.040787	0	-0.450950	0	-0.549050	-1	-0.872715	-1	-0.127285	0
TR 391	182	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.943090	1	0.056910	0	1.402083	1	-0.402083	0	1.063729	1	-0.063729	0	0.809448	1	0.190552	0
TR 392	504	1	0.944360	1	0.055640	0	0.974661	1	0.025339	0	0.934234	1	0.065766	0	1.113380	1	-0.113380	0	1.306441	1	-0.306441	0	0.461753	0	0.538247	1
TR 393	549	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.941786	1	0.058214	0	0.567822	1	0.432178	0	0.479784	0	0.520216	1	0.876778	1	0.123222	0
TR 394	360	1	0.944360	1	0.055640	0	0.959804	1	0.040196	0	0.938750	1	0.061250	0	0.544463	1	0.455537	0	0.656855	1	0.343145	0	0.616567	1	0.383433	0
TR 395	139	1	0.944360	1	0.055640	0	0.955782	1	0.044218	0	0.942937	1	0.057063	0	0.688759	1	0.311241	0	0.327326	0	0.672674	1	0.572028	1	0.427972	0
TR 396	92	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.959032	-1	-0.040968	0	-0.973241	-1	-0.026759	0	-0.997148	-1	-0.002852	0	-0.747146	-1	-0.252854	0
TR 397	188	-1	-0.909173	-1	-0.090827	0	-0.904360	-1	-0.095640	0	-0.958610	-1	-0.041390	0	-0.828288	-1	-0.171712	0	-0.218078	0	-0.781922	-1	-0.954996	-1	-0.045004	0
TR 398	605	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960911	-1	-0.039089	0	-1.062273	-1	0.062273	0	-1.010409	-1	0.010409	0	-0.871402	-1	-0.128598	0
TR 399	33	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943101	1	0.056899	0	0.832598	1	0.167402	0	0.811633	1	0.188367	0	0.988470	1	0.011530	0
TR 400	594	1	0.944255	1	0.055745	0	0.859187	1	0.140813	0	0.942756	1	0.057244	0	0.435364	0	0.564636	1	0.494997	0	0.505003	1	0.819396	1	0.180604	0
TR 401	248	1	0.944360	1	0.055640	0	0.974421	1	0.025579	0	0.943149	1	0.056851	0	0.788805	1	0.211195	0	0.483788	0	0.516212	1	1.106756	1	-0.106756	0
TR 402	473	1	0.944360	1	0.055640	0	0.972232	1	0.027768	0	0.670225	1	0.329775	0	0.727273	1	0.272727	0	0.816211	1	0.183789	0	-0.162910	0	1.162910	1
TR 403	22	-1	-0.909173	-1	-0.090827	0	-0.904783	-1	-0.095217	0	-0.958610	-1	-0.041390	0	-0.938209	-1	-0.061791	0	-0.562703	-1	-0.437297	0	-0.954996	-1	-0.045004	0
TR 404	23	1	0.944360	1	0.055640	0	0.974556	1	0.025444	0	0.942939	1	0.057061	0	1.285759	1	-0.285759	0	1.370186	1	-0.370186	0	0.510925	1	0.489075	0
TR 405	458	1	0.944360	1	0.055640	0	0.800693	1	0.199307	0	0.663103	1	0.336897	0	0.715953	1	0.284047	0	0.569024	1	0.430976	0	0.404771	0	0.595229	1
TR 406	191	-1	-0.909173	-1	-0.090827	0	-0.805144	-1	-0.194856	0	-0.779063	-1	-0.220937	0	-0.693823	-1	-0.306177	0	-0.217323	0	-0.782677	-1	-0.525696	-1	-0.474304	0
TR 407	49	-1	-0.909173	-1	-0.090827	0	-0.904650	-1	-0.095350	0	-0.724627	-1	-0.275373	0	-1.225849	-1	0.225849	0	-1.303416	-1	0.303416	0	0.003863	0	-1.003863	-1
TR 408	45	-1	-0.909173	-1	-0.090827	0	-0.901587	-1	-0.098413	0	-0.960228	-1	-0.039772	0	-0.707877	-1	-0.292123	0	-0.300325	0	-0.699675	-1	-0.629424	-1	-0.370576	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 409	345	-1	-0.909078	-1	-0.090922	0	-0.904967	-1	-0.095033	0	0.935673	1	-1.935673	-2	-0.016474	0	-0.983526	-1	-1.037291	-1	0.037291	0	0.904858	1	-1.904858	-2
TR 410	111	-1	-0.908811	-1	-0.091189	0	-0.862614	-1	-0.137386	0	-0.540239	-1	-0.459761	0	-0.169314	0	-0.830686	-1	-0.295166	0	-0.704834	-1	0.147049	0	-1.147049	-1
TR 411	434	1	0.944360	1	0.055640	0	0.973678	1	0.026322	0	0.930049	1	0.069951	0	0.619125	1	0.380875	0	0.461961	0	0.538039	1	0.228007	0	0.771993	1
TR 412	335	1	-0.903674	-1	1.903674	2	0.611068	1	0.388932	0	0.436881	0	0.563119	1	0.516617	1	0.483383	0	0.077443	0	0.922557	1	0.650242	1	0.349758	0
TR 413	528	-1	-0.909173	-1	-0.090827	0	-0.904968	-1	-0.095032	0	-0.540239	-1	-0.459761	0	-0.827285	-1	-0.172715	0	-0.782183	-1	-0.217817	0	0.147049	0	-1.147049	-1
TR 414	476	1	0.943936	1	0.056064	0	0.180612	0	0.819388	1	0.881778	1	0.118222	0	0.765482	1	0.234518	0	0.432246	0	0.567754	1	0.290822	0	0.709178	1
TR 415	575	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960559	-1	-0.039441	0	-0.952462	-1	-0.047538	0	-0.788696	-1	-0.211304	0	-0.619593	-1	-0.380407	0
TR 416	16	-1	-0.836478	-1	-0.163522	0	0.970832	1	-1.970832	-2	-0.711578	-1	-0.288422	0	-0.429971	0	-0.570029	-1	-0.106511	0	-0.893489	-1	-0.106303	0	-0.893697	-1
TR 417	199	-1	-0.909173	-1	-0.090827	0	-0.904933	-1	-0.095067	0	-0.951438	-1	-0.048562	0	-0.751186	-1	-0.248814	0	-0.797098	-1	-0.202902	0	-0.289254	0	-0.710746	-1
TR 418	560	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.942999	1	0.057001	0	1.363679	1	-0.363679	0	1.427520	1	-0.427520	0	1.058058	1	-0.058058	0
TR 419	239	-1	-0.909173	-1	-0.090827	0	-0.899227	-1	-0.100773	0	-0.960914	-1	-0.039086	0	-0.785135	-1	-0.214865	0	-0.399225	0	-0.600775	-1	-1.098591	-1	0.098591	0
TR 420	490	1	0.944360	1	0.055640	0	0.974588	1	0.025412	0	0.943146	1	0.056854	0	0.956892	1	0.043108	0	0.957814	1	0.042186	0	0.903269	1	0.096731	0
TR 421	566	1	0.944360	1	0.055640	0	0.974676	1	0.025324	0	0.943153	1	0.056847	0	0.899878	1	0.100122	0	1.053230	1	-0.053230	0	1.154258	1	-0.154258	0
TR 422	236	1	0.935827	1	0.064173	0	0.960347	1	0.039653	0	0.453041	0	0.546959	1	0.007066	0	0.992934	1	0.520148	1	0.479852	0	-0.204918	0	1.204918	1
TR 423	329	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943162	1	0.056838	0	1.871994	2	-0.871994	-1	1.798304	2	-0.798304	-1	1.216136	1	-0.216136	0
TR 424	72	1	0.944344	1	0.055656	0	0.414472	0	0.585528	1	0.943112	1	0.056888	0	0.137136	0	0.862864	1	-0.134159	0	1.134159	1	0.782550	1	0.217450	0
TR 425	253	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943169	1	0.056831	0	0.928376	1	0.071624	0	0.723858	1	0.276142	0	1.315156	1	-0.315156	0
TR 426	36	0	0.398830	0	-0.398830	0	0.918708	1	-0.918708	-1	0.941360	1	-0.941360	-1	0.522470	1	-0.522470	-1	0.087342	0	-0.087342	0	0.889708	1	-0.889708	-1
TR 427	413	-1	-0.873720	-1	-0.126280	0	-0.805388	-1	-0.194612	0	-0.670853	-1	-0.329147	0	0.400358	0	-1.400358	-1	0.232048	0	-1.232048	-1	0.052027	0	-1.052027	-1
TR 428	295	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943167	1	0.056833	0	1.446404	1	-0.446404	0	1.723219	2	-0.723219	-1	1.464123	1	-0.464123	0
TR 429	503	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943127	1	0.056873	0	1.790999	2	-0.790999	-1	1.939153	2	-0.939153	-1	1.259453	1	-0.259453	0
TR 430	124	-1	-0.909173	-1	-0.090827	0	-0.904856	-1	-0.095144	0	-0.923827	-1	-0.076173	0	-0.962987	-1	-0.037013	0	-0.737617	-1	-0.262383	0	-0.806053	-1	-0.193947	0
TR 431	123	-1	-0.909173	-1	-0.090827	0	-0.849642	-1	-0.150358	0	-0.959111	-1	-0.040889	0	-0.649740	-1	-0.350260	0	-0.310982	0	-0.689018	-1	-0.493794	0	-0.506206	-1
TR 432	562	1	0.944360	1	0.055640	0	0.974619	1	0.025381	0	0.942999	1	0.057001	0	0.937398	1	0.062602	0	1.177978	1	-0.177978	0	1.058058	1	-0.058058	0
TR 433	465	0	0.944360	1	-0.944360	-1	0.901835	1	-0.901835	-1	-0.204218	0	0.204218	0	0.604240	1	-0.604240	-1	0.645749	1	-0.645749	-1	0.208914	0	-0.208914	0
TR 434	252	1	0.944360	1	0.055640	0	0.974661	1	0.025339	0	0.943169	1	0.056831	0	1.168623	1	-0.168623	0	0.724522	1	0.275478	0	1.387113	1	-0.387113	0
TR 435	93	1	0.939844	1	0.060156	0	0.498402	0	0.501598	1	0.931024	1	0.068976	0	0.533754	1	0.466246	0	0.103468	0	0.896532	1	0.578989	1	0.421011	0
TR 436	262	-1	-0.909159	-1	-0.090841	0	-0.292954	0	-0.707046	-1	-0.251436	0	-0.748564	-1	-0.079119	0	-0.920881	-1	-0.048652	0	-0.951348	-1	0.089667	0	-1.089667	-1
TR 437	659	-1	-0.909173	-1	-0.090827	0	-0.903845	-1	-0.096155	0	-0.537469	-1	-0.462531	0	-0.258554	0	-0.741446	-1	-0.631718	-1	-0.368282	0	0.420514	0	-1.420514	-1
TR 438	516	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.886369	1	0.113631	0	0.679545	1	0.320455	0	1.154022	1	-0.154022	0	0.449968	0	0.550032	1
TR 439	145	-1	-0.909173	-1	-0.090827	0	-0.904962	-1	-0.095038	0	-0.956817	-1	-0.043183	0	-1.135711	-1	0.135711	0	-1.108161	-1	0.108161	0	-0.486789	0	-0.513211	-1
TR 440	586	-1	-0.909173	-1	-0.090827	0	-0.904967	-1	-0.095033	0	-0.959020	-1	-0.040980	0	-0.696938	-1	-0.303062	0	-0.681376	-1	-0.318624	0	-0.486157	0	-0.513843	-1
TR 441	457	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.205768	0	0.794232	1	0.709726	1	0.290274	0	0.758640	1	0.241360	0	0.148574	0	0.851426	1
TR 442	129	-1	-0.733746	-1	-0.266254	0	-0.758210	-1	-0.241790	0	-0.958003	-1	-0.041997	0	-0.198234	0	-0.801766	-1	-0.056004	0	-0.943996	-1	-0.667713	-1	-0.332287	0
TR 443	428	0	-0.007411	0	0.007411	0	-0.039776	0	0.039776	0	0.609523	1	-0.609523	-1	0.386805	0	-0.386805	0	0.341403	0	-0.341403	0	0.049810	0	-0.049810	0
TR 444	157	1	0.944360	1	0.055640	0	0.974633	1	0.025367	0	0.940772	1	0.059228	0	1.116283	1	-0.116283	0	1.083808	1	-0.083808	0	0.620257	1	0.379743	0
TR 445	322	1	-0.909173	-1	1.909173	2	0.254824	0	0.745176	1	0.930049	1	0.069951	0	0.171350	0	0.828650	1	-0.110280	0	1.110280	1	0.228007	0	0.771993	1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 446	20	1	0.944294	1	0.055706	0	0.943883	1	0.056117	0	-0.251436	0	1.251436	1	0.127202	0	0.872798	1	0.305345	0	0.694655	1	0.089667	0	0.910333	1
TR 447	200	1	0.944360	1	0.055640	0	0.970834	1	0.029166	0	0.943164	1	0.056836	0	0.628652	1	0.371348	0	0.224857	0	0.775143	1	1.148711	1	-0.148711	0
TR 448	320	1	-0.909113	-1	1.909113	2	0.626389	1	0.373611	0	-0.251436	0	1.251436	1	-0.017694	0	1.017694	1	-0.051926	0	1.051926	1	0.089667	0	0.910333	1
TR 449	296	-1	-0.909173	-1	-0.090827	0	-0.888730	-1	-0.111270	0	0.573993	1	-1.573993	-2	-0.327522	0	-0.672478	-1	-0.427679	0	-0.572321	-1	0.205956	0	-1.205956	-1
TR 450	140	1	0.944095	1	0.055905	0	0.965363	1	0.034637	0	0.914248	1	0.085752	0	0.302028	0	0.697972	1	0.582159	1	0.417841	0	-0.016057	0	1.016057	1
TR 451	519	1	0.944360	1	0.055640	0	0.974171	1	0.025829	0	0.778800	1	0.221200	0	0.730612	1	0.269388	0	0.569551	1	0.430449	0	0.169101	0	0.830899	1
TR 452	435	1	0.944202	1	0.055798	0	0.841513	1	0.158487	0	0.930049	1	0.069951	0	0.222758	0	0.777242	1	0.060725	0	0.939275	1	0.228007	0	0.771993	1
TR 453	369	1	0.943867	1	0.056133	0	0.961444	1	0.038556	0	0.556999	1	0.443001	0	0.110137	0	0.889863	1	0.275712	0	0.724288	1	0.394044	0	0.605956	1
TR 454	635	-1	-0.909173	-1	-0.090827	0	-0.892873	-1	-0.107127	0	-0.763212	-1	-0.236788	0	-0.621862	-1	-0.378138	0	-0.513015	-1	-0.486985	0	0.375548	0	-1.375548	-1
TR 455	647	1	0.944211	1	0.055789	0	0.956015	1	0.043985	0	0.872358	1	0.127642	0	0.349710	0	0.650290	1	0.330088	0	0.669912	1	0.477172	0	0.522828	1
TR 456	572	1	0.944332	1	0.055668	0	-0.132475	0	1.132475	1	0.928646	1	0.071354	0	0.487050	0	0.512950	1	0.298392	0	0.701608	1	0.796331	1	0.203669	0
TR 457	447	-1	-0.909173	-1	-0.090827	0	-0.904848	-1	-0.095152	0	-0.960931	-1	-0.039069	0	-0.770305	-1	-0.229695	0	-0.144063	0	-0.855937	-1	-1.184974	-1	0.184974	0
TR 458	67	-1	-0.909173	-1	-0.090827	0	-0.904868	-1	-0.095132	0	-0.955024	-1	-0.044976	0	-0.986080	-1	-0.013920	0	-0.887044	-1	-0.112956	0	-0.396947	0	-0.603053	-1
TR 459	128	-1	-0.909173	-1	-0.090827	0	-0.904476	-1	-0.095524	0	-0.923827	-1	-0.076173	0	-1.569402	-2	0.569402	1	-1.038301	-1	0.038301	0	-0.806053	-1	-0.193947	0
TR 460	212	-1	-0.909173	-1	-0.090827	0	-0.903859	-1	-0.096141	0	-0.960058	-1	-0.039942	0	-1.306036	-1	0.306036	0	-1.085159	-1	0.085159	0	-0.831897	-1	-0.168103	0
TR 461	69	-1	-0.909173	-1	-0.090827	0	-0.904967	-1	-0.095033	0	-0.960840	-1	-0.039160	0	-0.921191	-1	-0.078809	0	-0.962356	-1	-0.037644	0	-0.984310	-1	-0.015690	0
TR 462	278	-1	-0.909173	-1	-0.090827	0	-0.904966	-1	-0.095034	0	-0.960787	-1	-0.039213	0	-1.257553	-1	0.257553	0	-1.271603	-1	0.271603	0	-1.142892	-1	0.142892	0
TR 463	573	-1	-0.909173	-1	-0.090827	0	-0.904745	-1	-0.095255	0	-0.957213	-1	-0.042787	0	-0.899215	-1	-0.100785	0	-0.366376	0	-0.633624	-1	-0.842353	-1	-0.157647	0
TR 464	357	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.853696	1	0.146304	0	1.120814	1	-0.120814	0	1.359611	1	-0.359611	0	0.564438	1	0.435562	0
TR 465	134	1	0.943972	1	0.056028	0	0.972502	1	0.027498	0	0.943090	1	0.056910	0	0.579794	1	0.420206	0	0.064956	0	0.935044	1	0.809448	1	0.190552	0
TR 466	654	1	0.944340	1	0.055660	0	0.574303	1	0.425697	0	0.903365	1	0.096635	0	0.614687	1	0.385313	0	0.236862	0	0.763138	1	0.435699	0	0.564301	1
TR 467	491	1	0.937116	1	0.062884	0	0.755933	1	0.244067	0	0.213580	0	0.786420	1	0.960344	1	0.039656	0	0.373716	0	0.626284	1	0.075632	0	0.924368	1
TR 468	166	-1	-0.889238	-1	-0.110762	0	-0.904478	-1	-0.095522	0	0.737562	1	-1.737562	-2	0.390244	0	-1.390244	-1	-0.491237	0	-0.508763	-1	0.104927	0	-1.104927	-1
TR 469	425	1	0.944359	1	0.055641	0	0.910909	1	0.089091	0	0.893676	1	0.106324	0	0.718240	1	0.281760	0	0.403714	0	0.596286	1	0.135613	0	0.864387	1
TR 470	584	1	0.944360	1	0.055640	0	0.973802	1	0.026198	0	0.942770	1	0.057230	0	1.015538	1	-0.015538	0	1.077518	1	-0.077518	0	1.042873	1	-0.042873	0
TR 471	596	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.960781	-1	-0.039219	0	-0.900414	-1	-0.099586	0	-0.836796	-1	-0.163204	0	-1.115407	-1	0.115407	0
TR 472	632	1	0.944358	1	0.055642	0	0.974284	1	0.025716	0	0.467125	0	0.532875	1	0.306709	0	0.693291	1	0.758858	1	0.241142	0	0.414535	0	0.585465	1
TR 473	489	-1	-0.907126	-1	-0.092874	0	0.436634	0	-1.436634	-1	-0.275353	0	-0.724647	-1	-0.905724	-1	-0.094276	0	-0.948343	-1	-0.051657	0	-0.825208	-1	-0.174792	0
TR 474	31	-1	-0.909171	-1	-0.090829	0	-0.094529	0	-0.905471	-1	-0.958486	-1	-0.041514	0	-0.256246	0	-0.743754	-1	-0.066365	0	-0.933635	-1	-0.661343	-1	-0.338657	0
TR 475	472	1	0.944360	1	0.055640	0	0.974654	1	0.025346	0	0.670225	1	0.329775	0	0.675633	1	0.324367	0	0.903996	1	0.096004	0	-0.162910	0	1.162910	1
TR 476	628	1	0.944360	1	0.055640	0	0.974608	1	0.025392	0	0.935843	1	0.064157	0	1.043247	1	-0.043247	0	0.909306	1	0.090694	0	0.726500	1	0.273500	0
TR 477	327	-1	-0.909173	-1	-0.090827	0	-0.904961	-1	-0.095039	0	-0.959913	-1	-0.040087	0	-1.501333	-2	0.501333	1	-1.666634	-2	0.666634	1	-0.627552	-1	-0.372448	0
TR 478	404	1	0.944293	1	0.055707	0	0.848001	1	0.151999	0	0.205768	0	0.794232	1	0.453513	0	0.546487	1	0.444403	0	0.555597	1	0.148574	0	0.851426	1
TR 479	508	1	0.944360	1	0.055640	0	0.949859	1	0.050141	0	0.918490	1	0.081510	0	0.698949	1	0.301051	0	0.696407	1	0.303593	0	0.323425	0	0.676575	1
TR 480	196	-1	-0.909173	-1	-0.090827	0	-0.904961	-1	-0.095039	0	-0.960893	-1	-0.039107	0	-0.950126	-1	-0.049874	0	-0.977163	-1	-0.022837	0	-1.392823	-1	0.392823	0
TR 481	120	0	-0.295399	0	0.295399	0	0.962417	1	-0.962417	-1	-0.200079	0	0.200079	0	0.300397	0	-0.300397	0	0.420690	0	-0.420690	0	-0.440756	0	0.440756	0
TR 482	550	1	0.944360	1	0.055640	0	0.974659	1	0.025341	0	0.841786	1	0.058214	0	0.612425	1	0.387575	0	0.588404	1	0.411596	0	0.876778	1	0.123222	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 483	388	1	0.944360	1	0.055640	0	0.973762	1	0.026238	0	0.859331	1	0.140669	0	0.840134	1	0.159866	0	0.652144	1	0.347856	0	0.390113	0	0.609887	1
TR 484	210	1	0.944187	1	0.055813	0	0.973427	1	0.026573	0	-0.304061	0	1.304061	1	0.345310	0	0.654690	1	0.632546	1	0.367454	0	-0.087849	0	1.087849	1
TR 485	294	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943069	1	0.056931	0	0.552801	1	0.447199	0	0.604365	1	0.395635	0	0.919965	1	0.080035	0
TR 486	44	1	0.937925	1	0.062075	0	0.918480	1	0.081520	0	0.205768	0	0.794232	1	-0.071718	0	1.071718	1	0.202657	0	0.797343	1	0.148574	0	0.851426	1
TR 487	395	1	0.944360	1	0.055640	0	0.862557	1	0.137443	0	0.941713	1	0.058287	0	0.549561	1	0.450439	0	0.249316	0	0.750684	1	0.467008	0	0.532992	1
TR 488	590	1	0.944360	1	0.055640	0	0.973162	1	0.026838	0	0.941140	1	0.058860	0	1.254414	1	-0.254414	0	1.078401	1	-0.078401	0	0.898830	1	0.101170	0
TR 489	282	1	0.943546	1	0.056454	0	0.725151	1	0.274849	0	-0.251436	0	1.251436	1	0.094572	0	0.905428	1	0.138767	0	0.861233	1	0.089667	0	0.910333	1
TR 490	526	-1	-0.837641	-1	-0.162359	0	-0.903633	-1	-0.096367	0	0.573993	1	-1.573993	-2	-0.180560	0	-0.819440	-1	-0.392472	0	-0.607528	-1	0.205956	0	-1.205956	-1
TR 491	255	-1	-0.909173	-1	-0.090827	0	-0.904969	-1	-0.095031	0	-0.935407	-1	-0.064593	0	-1.000520	-1	0.000520	0	-1.323380	-1	0.323380	0	-0.039870	0	-0.960130	-1
TR 492	624	1	0.944360	1	0.055640	0	0.974653	1	0.025347	0	0.943073	1	0.056927	0	1.296926	1	-0.296926	0	1.161677	1	-0.161677	0	1.238513	1	-0.238513	0
TR 493	346	1	0.700877	1	0.299123	0	-0.904070	-1	1.904070	2	0.936773	1	0.063227	0	0.323491	0	0.676509	1	-0.285015	0	1.285015	1	0.648661	1	0.351339	0
TR 494	91	1	0.944360	1	0.055640	0	0.969413	1	0.030587	0	0.943076	1	0.056924	0	0.678071	1	0.321929	0	0.690334	1	0.309666	0	0.723644	1	0.276356	0
TR 495	153	-1	-0.909173	-1	-0.090827	0	-0.896708	-1	-0.103292	0	-0.959903	-1	-0.040097	0	-0.305283	0	-0.694717	-1	0.090039	0	-1.090039	-1	-0.689764	-1	-0.310236	0
TR 496	527	-1	-0.909173	-1	-0.090827	0	-0.902806	-1	-0.097194	0	-0.892226	-1	-0.107774	0	-0.596561	-1	-0.403439	0	-0.362786	0	-0.637214	-1	-0.051920	0	-0.948080	-1
TR 497	99	1	0.944360	1	0.055640	0	0.974675	1	0.025325	0	0.556999	1	0.443001	0	1.508355	2	-0.508355	-1	1.403123	1	-0.403123	0	0.394044	0	0.605956	1
TR 498	164	1	0.944360	1	0.055640	0	0.969332	1	0.030668	0	0.942788	1	0.057212	0	0.846246	1	0.153754	0	0.703849	1	0.296151	0	0.935685	1	0.064315	0
TR 499	143	1	0.944360	1	0.055640	0	0.974667	1	0.025333	0	0.942363	1	0.057637	0	1.219248	1	-0.219248	0	1.087764	1	-0.087764	0	0.783985	1	0.216015	0
TR 500	225	1	0.944360	1	0.055640	0	0.972073	1	0.027927	0	0.943055	1	0.056945	0	0.803908	1	0.196092	0	0.870784	1	0.129216	0	0.573072	1	0.426928	0
TR 501	405	-1	0.944358	1	-1.944358	-2	0.863746	1	-1.863746	-2	0.905137	1	-1.905137	-2	0.489028	0	-1.489028	-1	0.380648	0	-1.380648	-1	0.163759	0	-1.163759	-1
TR 502	657	1	0.944359	1	0.055641	0	0.969206	1	0.030794	0	0.557842	1	0.442158	0	0.970215	1	0.029785	0	0.969326	1	0.030674	0	0.108549	0	0.891451	1
TR 503	567	1	0.944360	1	0.055640	0	0.974229	1	0.025771	0	0.943153	1	0.056847	0	0.550794	1	0.449206	0	0.659708	1	0.340292	0	1.154258	1	-0.154258	0
TR 504	645	1	0.944360	1	0.055640	0	0.973400	1	0.026600	0	0.842277	1	0.157723	0	0.932965	1	0.067035	0	0.961147	1	0.038853	0	0.460024	0	0.539976	1
TR 505	376	1	0.631848	1	0.368152	0	0.045442	0	0.954558	1	0.686052	1	0.313948	0	0.168720	0	0.831280	1	-0.070015	0	1.070015	1	0.957134	1	0.042866	0
TR 506	211	1	0.944350	1	0.055650	0	0.970009	1	0.029991	0	0.700617	1	0.299383	0	0.328460	0	0.671540	1	0.571017	1	0.428983	0	0.308240	0	0.691760	1
TR 507	90	0	0.081489	0	-0.081489	0	-0.191295	0	0.191295	0	-0.824691	-1	0.824691	1	-0.421752	0	0.421752	0	-0.227286	0	0.227286	0	-0.339136	0	0.339136	0
TR 508	462	0	0.944360	1	-0.944360	-1	0.955404	1	-0.955404	-1	-0.551001	-1	0.551001	1	0.210956	0	-0.210956	0	0.747166	1	-0.747166	-1	0.009718	0	-0.009718	0
TR 509	154	1	0.944360	1	0.055640	0	0.930077	1	0.069923	0	0.943103	1	0.056897	0	0.944894	1	0.055106	0	0.569895	1	0.430105	0	0.824633	1	0.175367	0
TR 510	197	1	0.944360	1	0.055640	0	0.329729	0	0.670271	1	0.943149	1	0.056851	0	0.617284	1	0.382716	0	0.205627	0	0.794373	1	1.056470	1	-0.056470	0
TR 511	338	-1	-0.909173	-1	-0.090827	0	-0.904682	-1	-0.095318	0	-0.874188	-1	-0.125812	0	-0.398395	0	-0.601605	-1	-0.350703	0	-0.649297	-1	0.140692	0	-1.140692	-1
TR 512	276	-1	-0.909173	-1	-0.090827	0	-0.904584	-1	-0.095416	0	-0.960478	-1	-0.039522	0	-0.855219	-1	-0.144781	0	-0.840953	-1	-0.159047	0	-0.434888	0	-0.565112	-1
TR 513	102	1	0.944360	1	0.055640	0	0.974151	1	0.025849	0	0.943162	1	0.056838	0	0.822860	1	0.177140	0	0.746575	1	0.253425	0	1.216136	1	-0.216136	0
TR 514	259	0	-0.553962	-1	0.553962	1	-0.411999	0	0.411999	0	-0.117491	0	0.117491	0	-0.091355	0	0.091355	0	0.013747	0	-0.013747	0	0.111718	0	-0.111718	0
TR 515	569	1	0.944360	1	0.055640	0	0.974644	1	0.025356	0	0.883994	1	0.116006	0	0.787756	1	0.212244	0	0.995358	1	0.004642	0	0.217328	0	0.782672	1
TR 516	610	1	0.941859	1	0.058141	0	0.837049	1	0.162951	0	-0.058186	0	1.058186	1	0.061729	0	0.938271	1	0.348294	0	0.651706	1	0.359535	0	0.640465	1
TR 517	535	1	0.944360	1	0.055640	0	0.974348	1	0.025652	0	0.939145	1	0.060855	0	0.703788	1	0.296212	0	0.669260	1	0.330740	0	0.424529	0	0.575471	1
TR 518	419	0	0.053517	0	-0.053517	0	-0.620909	-1	0.620909	1	-0.431320	0	0.431320	0	-0.085618	0	0.085618	0	-0.198834	0	0.198834	0	0.094225	0	-0.094225	0
TR 519	105	1	0.944360	1	0.055640	0	0.974659	1	0.025341	0	0.943090	1	0.056910	0	1.417992	1	-0.417992	0	1.089620	1	-0.089620	0	0.809448	1	0.190552	0

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TR 520	51	1	0.944360	1	0.055640	0	0.974368	1	0.025612	0	0.943120	1	0.056880	0	0.611454	1	0.388546	0	0.548372	1	0.451628	0	0.761187	1	0.238813	0
TR 521	343	-1	-0.909169	-1	-0.090831	0	0.972592	1	-1.972592	-2	-0.774995	-1	-0.225005	0	0.572031	1	-1.572031	-2	0.397157	0	-1.397157	-1	-0.102926	0	-0.897074	-1
TR 522	158	1	0.944360	1	0.055640	0	0.960107	1	0.039893	0	0.936057	1	0.063943	0	1.089530	1	-0.089530	0	0.874611	1	0.125389	0	0.893488	1	0.106512	0
TR 523	136	1	0.944360	1	0.055640	0	0.869396	1	0.130604	0	0.942449	1	0.057551	0	0.839047	1	0.160953	0	0.174116	0	0.825884	1	1.235949	1	-0.235949	0
TR 524	73	1	0.944360	1	0.055640	0	0.974670	1	0.025330	0	0.904498	1	0.095502	0	0.725178	1	0.274822	0	0.689609	1	0.310391	0	0.489271	0	0.510729	1
TR 525	540	-1	-0.909173	-1	-0.090827	0	-0.817983	-1	-0.182017	0	-0.304061	0	-0.695939	-1	-0.236180	0	-0.763820	-1	-0.006539	0	-0.993461	-1	-0.087949	0	-0.912051	-1
TR 526	148	-1	-0.909173	-1	-0.090827	0	-0.904814	-1	-0.095186	0	0.205768	0	-1.205768	-1	-0.366289	0	-0.633711	-1	-0.372884	0	-0.627116	-1	0.148574	0	-1.148574	-1
TST 1	292	-1	-0.909173	-1	-0.090827	0	-0.904923	-1	-0.095077	0	0.743054	1	-1.743054	-2	-0.747504	-1	-0.252496	0	-1.153534	-1	0.153534	0	0.165193	0	-1.165193	-1
TST 2	159	-1	-0.909173	-1	-0.090827	0	-0.904860	-1	-0.095140	0	-0.960148	-1	-0.039852	0	-0.418196	0	-0.581804	-1	-0.494323	0	-0.505677	-1	-0.304608	0	-0.695392	-1
TST 3	19	1	0.944360	1	0.055640	0	0.974338	1	0.025662	0	0.943157	1	0.056843	0	0.541965	1	0.458035	0	0.509907	1	0.490093	0	1.089804	1	-0.089804	0
TST 4	96	-1	-0.909173	-1	-0.090827	0	-0.473292	0	-0.526708	-1	-0.960853	-1	-0.039147	0	-0.179330	0	-0.820670	-1	-0.138422	0	-0.861578	-1	-0.512560	-1	-0.487440	0
TST 5	263	1	0.944360	1	0.055640	0	0.974237	1	0.025763	0	-0.251436	0	1.251436	1	0.314157	0	0.685843	1	0.579814	1	0.420186	0	0.089667	0	0.910333	1
TST 6	479	0	0.942208	1	-0.942208	-1	0.974180	1	-0.974180	-1	0.670225	1	-0.670225	-1	0.339109	0	-0.339109	0	0.356843	0	-0.356843	0	-0.162910	0	0.162910	0
TST 7	85	1	0.944360	1	0.055640	0	0.974673	1	0.025327	0	0.943166	1	0.056834	0	1.769573	2	-0.769573	-1	1.461904	1	-0.461904	0	1.649438	2	-0.649438	-1
TST 8	74	-1	-0.909173	-1	-0.090827	0	-0.904242	-1	-0.095758	0	-0.942688	-1	-0.057312	0	-0.917531	-1	-0.082469	0	-0.837637	-1	-0.162363	0	0.009268	0	-1.009268	-1
TST 9	576	1	0.944360	1	0.055640	0	0.973513	1	0.026487	0	0.936869	1	0.063131	0	0.492536	0	0.507464	1	0.661815	1	0.338185	0	0.824300	1	0.175700	0
TST 10	332	1	0.944355	1	0.055645	0	0.974640	1	0.025360	0	0.710640	1	0.289360	0	1.119771	1	-0.119771	0	1.047012	1	-0.047012	0	0.126205	0	0.873795	1
TST 11	9	1	0.944360	1	0.055640	0	0.918606	1	0.081394	0	0.938265	1	0.061735	0	0.359351	0	0.640649	1	0.263275	0	0.736725	1	0.610479	1	0.389521	0
TST 12	308	1	0.943411	1	0.056589	0	0.969429	1	0.030571	0	-0.251436	0	1.251436	1	-0.356738	0	1.356738	1	-0.112216	0	1.112216	1	0.089667	0	0.910333	1
TST 13	364	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.113397	0	0.886603	1	1.873014	2	-0.873014	-1	1.192578	1	-0.192578	0	0.627574	1	0.372426	0
TST 14	453	1	0.944360	1	0.055640	0	0.974494	1	0.025506	0	0.205768	0	0.794232	1	0.861978	1	0.138022	0	1.228869	1	-0.228869	0	0.148574	0	0.851426	1
TST 15	401	1	0.944360	1	0.055640	0	0.923731	1	0.076269	0	0.107411	0	0.892589	1	0.833756	1	0.166244	0	0.697300	1	0.302700	0	0.234377	0	0.765623	1
TST 16	520	1	0.944360	1	0.055640	0	0.972115	1	0.027885	0	-0.117491	0	1.117491	1	0.310900	0	0.689100	1	0.285163	0	0.714837	1	0.111718	0	0.888282	1
TST 17	290	-1	-0.909173	-1	-0.090827	0	-0.904766	-1	-0.095234	0	0.273120	0	-1.273120	-1	-0.691818	-1	-0.308182	0	-1.342463	-1	0.342463	0	0.361050	0	-1.361050	-1
TST 18	180	1	0.944360	1	0.055640	0	0.968613	1	0.031387	0	0.943138	1	0.056862	0	1.241695	1	-0.241695	0	0.843068	1	0.156932	0	1.275043	1	-0.275043	0
TST 19	53	1	0.943255	1	0.056745	0	0.964500	1	0.035500	0	0.205768	0	0.794232	1	0.203411	0	0.796589	1	0.226060	0	0.773940	1	0.148574	0	0.851426	1
TST 20	254	1	0.944360	1	0.055640	0	0.974659	1	0.025341	0	0.943146	1	0.056854	0	1.283903	1	-0.283903	0	0.863082	1	0.136918	0	1.012748	1	-0.012748	0
TST 21	368	1	0.944360	1	0.055640	0	0.974486	1	0.025514	0	0.556999	1	0.443001	0	0.567620	1	0.432380	0	0.586913	1	0.413087	0	0.394044	0	0.605956	1
TST 22	348	1	0.944360	1	0.055640	0	0.974421	1	0.025579	0	0.556999	1	0.443001	0	0.774526	1	0.225474	0	0.865403	1	0.134597	0	0.394044	0	0.605956	1
TST 23	475	1	0.944360	1	0.055640	0	0.973721	1	0.026279	0	-0.764260	-1	1.764260	2	1.254886	1	-0.254886	0	0.988845	1	0.011155	0	0.032947	0	0.967053	1
TST 24	162	1	0.944360	1	0.055640	0	0.965253	1	0.034747	0	0.941487	1	0.058513	0	0.863249	1	0.136751	0	0.722195	1	0.277805	0	0.915539	1	0.084461	0
TST 25	192	-1	-0.855592	-1	-0.144408	0	-0.021132	0	-0.978868	-1	-0.251436	0	-0.748564	-1	0.227140	0	-1.227140	-1	0.237437	0	-1.237437	-1	0.089667	0	-1.089667	-1
TST 26	521	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.913116	1	0.086884	0	1.336490	1	-0.336490	0	1.620341	2	-0.620341	-1	0.237621	0	0.762379	1
TST 27	449	-1	-0.908955	-1	-0.091045	0	-0.883051	-1	-0.116949	0	0.205768	0	-1.205768	-1	-0.127700	0	-0.872300	-1	0.003127	0	-1.003127	-1	0.148574	0	-1.148574	-1
TST 28	617	1	0.942403	1	0.057597	0	0.974489	1	0.025511	0	-0.958523	-1	1.958523	2	0.315638	0	0.684362	1	0.934719	1	0.065281	0	-0.548214	-1	1.548214	2
TST 29	41	-1	-0.909173	-1	-0.090827	0	-0.904771	-1	-0.095229	0	-0.959032	-1	-0.040968	0	-0.832065	-1	-0.167935	0	-0.549131	-1	-0.450869	0	-0.747146	-1	-0.252854	0
TST 30	147	-1	-0.907387	-1	-0.092613	0	-0.812005	-1	-0.187995	0	-0.251436	0	-0.748564	-1	0.079617	0	-1.079617	-1	0.054984	0	-1.054984	-1	0.089667	0	-1.089667	-1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TST 31	417	-1	-0.909162	-1	-0.090838	0	-0.902668	-1	-0.097332	0	-0.431320	0	-0.568680	-1	-0.020694	0	-0.979306	-1	-0.282820	0	-0.717180	-1	0.094225	0	-1.094225	-1
TST 32	289	-1	-0.909173	-1	-0.090827	0	-0.904778	-1	-0.095222	0	0.255573	0	-1.255573	-1	-0.789198	-1	-0.210802	0	-0.935651	-1	-0.064349	0	0.104852	0	-1.104852	-1
TST 33	589	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.950552	-1	-0.049448	0	-0.647487	-1	-0.352513	0	-0.610747	-1	-0.389253	0	-0.640815	-1	-0.359185	0
TST 34	26	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.943124	1	0.056876	0	0.379909	0	0.620091	1	0.763138	1	0.236862	0	0.788978	1	0.211022	0
TST 35	29	1	0.944356	1	0.055644	0	0.974188	1	0.025812	0	0.708609	1	0.291391	0	0.163333	0	0.836667	1	0.375243	0	0.624757	1	0.491405	0	0.508595	1
TST 36	487	1	0.944353	1	0.055647	0	0.967754	1	0.032246	0	0.943083	1	0.056917	0	1.341360	1	-0.341360	0	0.841962	1	0.158038	0	1.582904	2	-0.582904	-1
TST 37	331	0	-0.909173	-1	0.909173	1	-0.821202	-1	0.821202	1	0.731251	1	-0.731251	-1	0.161363	0	-0.161363	0	0.181631	0	-0.181631	0	0.111020	0	-0.111020	0
TST 38	445	1	0.944360	1	0.055640	0	0.973289	1	0.026711	0	0.907406	1	0.092594	0	0.667906	1	0.332094	0	0.678578	1	0.321422	0	0.456730	0	0.543270	1
TST 39	291	-1	-0.909173	-1	-0.090827	0	-0.904896	-1	-0.095104	0	0.255573	0	-1.255573	-1	-0.975112	-1	-0.024888	0	-1.195629	-1	0.195629	0	0.104852	0	-1.104852	-1
TST 40	409	-1	0.944351	1	-1.944351	-2	0.974163	1	-1.974163	-2	-0.812926	-1	-0.187074	0	0.478223	0	-1.478223	-1	0.905918	1	-1.905918	-2	-0.048961	0	-0.951039	-1
TST 41	421	1	0.944236	1	0.055764	0	0.952827	1	0.047173	0	-0.431320	0	1.431320	1	0.402973	0	0.597027	1	0.213084	0	0.786916	1	0.094225	0	0.905775	1
TST 42	272	1	0.944360	1	0.055640	0	0.929351	1	0.070649	0	0.943090	1	0.056910	0	0.682687	1	0.317333	0	0.456214	0	0.543786	1	0.809448	1	0.190552	0
TST 43	3	1	0.944274	1	0.055726	0	-0.867479	-1	1.867479	2	0.942912	1	0.057088	0	0.172955	0	0.827045	1	-0.121716	0	1.121716	1	0.905200	1	0.094800	0
TST 44	117	-1	-0.909173	-1	-0.090827	0	-0.904969	-1	-0.095031	0	-0.960668	-1	-0.039332	0	-0.557224	-1	-0.442776	0	-0.833248	-1	-0.166752	0	-0.941116	-1	-0.058884	0
TST 45	358	1	0.944360	1	0.055640	0	0.974629	1	0.025371	0	0.436881	0	0.563119	1	1.088907	1	-0.088907	0	1.052825	1	-0.052825	0	0.650242	1	0.349758	0
TST 46	100	1	0.944360	1	0.055640	0	0.974598	1	0.025402	0	0.556999	1	0.443001	0	1.120585	1	-0.120585	0	1.136841	1	-0.136841	0	0.394044	0	0.605956	1
TST 47	362	1	0.944360	1	0.055640	0	0.974679	1	0.025321	0	0.940794	1	0.059206	0	1.194181	1	-0.194181	0	1.242359	1	-0.242359	0	0.896924	1	0.103076	0
TST 48	89	-1	-0.909173	-1	-0.090827	0	-0.388520	0	-0.611480	-1	-0.959032	-1	-0.040968	0	-0.617677	-1	-0.382323	0	-0.053373	0	-0.946627	-1	-0.747146	-1	-0.252854	0
TST 49	467	-1	-0.909173	-1	-0.090827	0	-0.904969	-1	-0.095031	0	-0.960154	-1	-0.039846	0	-1.406286	-1	0.406286	0	-0.816648	-1	-0.183352	0	-1.003588	-1	0.003588	0
TST 50	286	1	0.944360	1	0.055640	0	0.974674	1	0.025326	0	0.935039	1	0.064961	0	0.130818	0	0.869182	1	0.456710	0	0.543290	1	0.751423	1	0.248577	0
TST 51	298	-1	-0.909173	-1	-0.090827	0	-0.903906	-1	-0.096094	0	-0.703771	-1	-0.296229	0	-0.355067	0	-0.644933	-1	-0.640834	-1	-0.359166	0	0.092007	0	-1.092007	-1
TST 52	568	0	-0.909169	-1	0.909169	1	-0.825701	-1	0.825701	1	-0.814342	-1	0.814342	1	-0.676037	-1	0.676037	1	-0.419711	0	0.419711	0	-0.274069	0	0.274069	0
TST 53	305	-1	-0.909173	-1	-0.090827	0	-0.880138	-1	-0.119862	0	-0.960830	-1	-0.039170	0	-0.243129	0	-0.756871	-1	-0.188064	0	-0.811936	-1	-0.583830	-1	-0.416170	0
TST 54	464	1	0.944360	1	0.055640	0	0.974329	1	0.025671	0	0.674174	1	0.325826	0	1.011334	1	-0.011334	0	1.426556	1	-0.426556	0	0.427487	0	0.572513	1
TST 55	652	1	0.944357	1	0.055643	0	0.974556	1	0.025444	0	-0.077336	0	1.077336	1	0.881447	1	0.118553	0	1.117300	1	-0.117300	0	0.492357	0	0.507643	1
TST 56	470	1	0.944360	1	0.055640	0	0.974615	1	0.025385	0	0.924290	1	0.075710	0	0.903433	1	0.096567	0	1.126130	1	-0.126130	0	0.264661	0	0.735339	1
TST 57	378	1	0.944307	1	0.055693	0	0.960984	1	0.039016	0	0.686052	1	0.313948	0	0.526738	1	0.473262	0	0.347689	0	0.652311	1	0.957134	1	0.042866	0
TST 58	12	1	0.944360	1	0.055640	0	0.974359	1	0.025641	0	0.943120	1	0.056880	0	0.695463	1	0.304537	0	0.654893	1	0.345107	0	0.868354	1	0.131646	0
TST 59	598	-1	-0.909173	-1	-0.090827	0	-0.904963	-1	-0.095037	0	-0.957801	-1	-0.042199	0	-0.392366	0	-0.607634	-1	-0.299553	0	-0.700447	-1	-0.545063	-1	-0.454937	0
TST 60	86	1	0.944360	1	0.055640	0	0.972670	1	0.027330	0	0.943152	1	0.056848	0	1.291550	1	-0.291550	0	0.312983	0	0.687017	1	1.351194	1	-0.351194	0
TST 61	227	1	0.944358	1	0.055642	0	0.974673	1	0.025327	0	0.934484	1	0.065516	0	1.181367	1	-0.181367	0	1.200739	1	-0.200739	0	0.495490	0	0.504510	1
TST 62	250	1	0.944360	1	0.055640	0	0.974359	1	0.025641	0	0.943149	1	0.056851	0	1.316171	1	-0.316171	0	0.978606	1	0.021394	0	1.106756	1	-0.106756	0
TST 63	334	-1	-0.909173	-1	-0.090827	0	-0.808180	-1	-0.191820	0	-0.960899	-1	-0.039101	0	-0.141805	0	-0.858195	-1	0.408459	0	-1.408459	-1	-1.186498	-1	0.186498	0
TST 64	78	1	0.944360	1	0.055640	0	0.973926	1	0.026074	0	-0.373899	0	1.373899	1	0.135805	0	0.864195	1	0.008271	0	0.991729	1	0.071501	0	0.928499	1
TST 65	37	1	0.944360	1	0.055640	0	0.974596	1	0.025404	0	0.943164	1	0.056836	0	0.425981	0	0.574019	1	0.315166	0	0.684834	1	1.148711	1	-0.148711	0
TST 66	563	1	0.944360	1	0.055640	0	0.974636	1	0.025364	0	0.942999	1	0.057001	0	0.664540	1	0.335460	0	0.889086	1	0.110914	0	1.058058	1	-0.058058	0
TST 67	94	1	0.944355	1	0.055645	0	0.974660	1	0.025340	0	0.857307	1	0.142693	0	1.015365	1	-0.015365	0	1.009794	1	-0.009794	0	0.492909	0	0.507091	1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TST 68	384	-1	-0.909173	-1	-0.090827	0	-0.904890	-1	-0.095110	0	-0.946617	-1	-0.053383	0	-0.686729	-1	-0.313271	0	-0.486907	0	-0.513093	-1	-0.525776	-1	-0.474224	0
TST 69	615	-1	-0.909173	-1	-0.090827	0	-0.904843	-1	-0.095157	0	0.232338	0	-1.232338	-1	-0.693735	-1	-0.306265	0	-0.787808	-1	-0.212192	0	0.445271	0	-1.445271	-1
TST 70	82	1	-0.904403	-1	1.904403	2	0.210028	0	0.789972	1	-0.507578	-1	1.507578	2	0.329593	0	0.670407	1	0.109610	0	0.890390	1	0.209165	0	0.790835	1
TST 71	344	-1	-0.826247	-1	-0.173753	0	-0.904967	-1	-0.095033	0	0.935673	1	-1.935673	-2	0.274455	0	-1.274455	-1	-0.838407	-1	-0.161593	0	0.904858	1	-1.904858	-2
TST 72	545	1	0.944360	1	0.055640	0	0.965497	1	0.034503	0	0.674174	1	0.325826	0	0.310920	0	0.689080	1	0.342295	0	0.657705	1	0.427487	0	0.572513	1
TST 73	304	-1	-0.909173	-1	-0.090827	0	-0.896169	-1	-0.103831	0	-0.209535	0	-0.790465	-1	-0.945409	-1	-0.054591	0	-1.461191	-1	0.461191	0	-0.146855	0	-0.853145	-1
TST 74	13	1	0.944350	1	0.055650	0	0.964618	1	0.035382	0	-0.390069	0	1.390069	1	-0.049307	0	1.049307	1	0.544224	1	0.455776	0	-0.560815	-1	1.560815	2
TST 75	373	1	0.944360	1	0.055640	0	0.974603	1	0.025397	0	0.686052	1	0.313948	0	1.275731	1	-0.275731	0	0.946140	1	0.053860	0	0.957134	1	0.042866	0
TST 76	496	-1	-0.909173	-1	-0.090827	0	-0.904897	-1	-0.095103	0	-0.944866	-1	-0.055134	0	-0.074846	0	-0.925154	-1	-0.324852	0	-0.675148	-1	-0.328985	0	-0.671015	-1
TST 77	179	1	0.944360	1	0.055640	0	0.974672	1	0.025328	0	0.943157	1	0.056843	0	1.533768	2	-0.533768	-1	1.031117	1	-0.031117	0	1.089804	1	-0.089804	0
TST 78	201	1	0.944360	1	0.055640	0	0.972301	1	0.027699	0	0.942389	1	0.057611	0	0.962915	1	0.037085	0	0.418515	0	0.581485	1	0.986077	1	0.013923	0
TST 79	173	1	0.944360	1	0.055640	0	-0.067048	0	1.067048	1	0.943157	1	0.056843	0	0.853798	1	0.146202	0	0.249754	0	0.750246	1	1.104990	1	-0.104990	0
TST 80	390	1	0.944360	1	0.055640	0	0.974015	1	0.025985	0	0.717204	1	0.282796	0	0.940945	1	0.059055	0	0.948535	1	0.051465	0	0.109756	0	0.890244	1
TST 81	144	-1	-0.909173	-1	-0.090827	0	-0.387987	0	-0.612013	-1	-0.960665	-1	-0.039335	0	-0.817203	-1	-0.182797	0	0.060950	0	-1.060950	-1	-0.831516	-1	-0.168484	0
TST 82	437	1	0.944360	1	0.055640	0	0.912530	1	0.087470	0	0.930049	1	0.069951	0	0.723438	1	0.276562	0	0.518786	1	0.481214	0	0.228007	0	0.771993	1
TST 83	506	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.934234	1	0.065766	0	1.071352	1	-0.071352	0	1.112814	1	-0.112814	0	0.461753	0	0.538247	1
TST 84	559	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.942664	1	0.057336	0	0.707555	1	0.292445	0	1.115710	1	-0.115710	0	0.834581	1	0.165419	0
TST 85	593	-1	-0.909047	-1	-0.090953	0	-0.690083	-1	-0.309917	0	0.728293	1	-1.728293	-2	0.036582	0	-1.036582	-1	0.094439	0	-1.094439	-1	0.301708	0	-1.301708	-1
TST 86	510	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943140	1	0.056860	0	1.370069	1	-0.370069	0	1.081095	1	-0.081095	0	1.274838	1	-0.274838	0
TST 87	265	1	0.944360	1	0.055640	0	0.960021	1	0.039979	0	-0.251436	0	1.251436	1	0.122407	0	0.877593	1	0.373973	0	0.626027	1	0.089667	0	0.910333	1
TST 88	222	1	0.944360	1	0.055640	0	0.876630	1	0.123370	0	0.726341	1	0.273659	0	0.853152	1	0.146848	0	0.353655	0	0.646345	1	0.345718	0	0.654282	1
TST 89	264	-1	-0.610924	-1	-0.389076	0	-0.838659	-1	-0.161341	0	-0.010424	0	-0.989576	-1	0.858173	1	-1.858173	-2	-0.370214	0	-0.629786	-1	0.461525	0	-1.461525	-1
TST 90	463	1	0.944360	1	0.055640	0	0.971741	1	0.028259	0	0.916483	1	0.083517	0	1.349399	1	-0.349399	0	1.552832	2	-0.552832	-1	0.660118	1	0.339882	0
TST 91	494	1	-0.431812	0	1.431812	1	0.969805	1	0.030195	0	-0.950788	-1	1.950788	2	0.223081	0	0.776919	1	0.361556	0	0.638444	1	-0.228913	0	1.228913	1
TST 92	517	1	0.944149	1	0.055851	0	-0.634383	-1	1.634383	2	-0.251436	0	1.251436	1	0.055667	0	0.944333	1	0.259385	0	0.740615	1	0.089667	0	0.910333	1
TST 93	71	1	0.944360	1	0.055640	0	0.974624	1	0.025376	0	0.943167	1	0.056833	0	1.450737	1	-0.450737	0	0.910868	1	0.089132	0	1.163896	1	-0.163896	0
TST 94	165	1	0.830204	1	0.169796	0	0.950935	1	0.049065	0	0.715557	1	0.284443	0	0.362254	0	0.637746	1	0.168620	0	0.831380	1	0.170625	0	0.829375	1
TST 95	564	-1	-0.909173	-1	-0.090827	0	-0.904970	-1	-0.095030	0	-0.958884	-1	-0.041116	0	-0.735763	-1	-0.264237	0	-0.653697	-1	-0.346303	0	-0.604408	-1	-0.395592	0
TST 96	25	-1	-0.909173	-1	-0.090827	0	-0.903395	-1	-0.096605	0	-0.923827	-1	-0.076173	0	-1.193540	-1	0.193540	0	-0.617393	-1	-0.382607	0	-0.806053	-1	-0.193947	0
TST 97	637	-1	-0.014538	0	-0.985462	-1	0.488705	0	-1.488705	-1	0.434978	0	-1.434978	-1	0.165148	0	-1.165148	-1	0.128015	0	-1.128015	-1	0.145786	0	-1.145786	-1
TST 98	571	1	0.944299	1	0.055701	0	-0.021290	0	1.021290	1	0.928646	1	0.071354	0	0.404102	0	0.595898	1	0.163210	0	0.836790	1	0.796331	1	0.203669	0
TST 99	444	1	0.944360	1	0.055640	0	0.974041	1	0.025959	0	0.907406	1	0.092594	0	0.854542	1	0.145458	0	0.747366	1	0.252634	0	0.456730	0	0.543270	1
TST 100	396	-1	-0.909093	-1	-0.090907	0	-0.904302	-1	-0.095698	0	0.107411	0	-1.107411	-1	0.028644	0	-1.028644	-1	-0.024246	0	-0.975754	-1	0.234377	0	-1.234377	-1
TST 101	261	1	0.944360	1	0.055640	0	0.974475	1	0.025525	0	0.943155	1	0.056845	0	1.576625	2	-0.576625	-1	1.421385	1	-0.421385	0	0.845513	1	0.154487	0
TST 102	461	-1	-0.909173	-1	-0.090827	0	-0.904943	-1	-0.095057	0	0.205768	0	-1.205768	-1	-1.364393	-1	0.364393	0	-1.769818	-2	0.769818	1	0.148574	0	-1.148574	-1
TST 103	240	0	0.944360	1	-0.944360	-1	-0.683076	-1	0.683076	1	0.942891	1	-0.942891	-1	0.617958	1	-0.617958	-1	0.157488	0	-0.157488	0	1.112061	1	-1.112061	-1
TST 104	167	1	0.944346	1	0.055654	0	0.965104	1	0.034896	0	-0.356087	0	1.356087	1	0.528370	1	0.471630	0	0.529742	1	0.470258	0	0.222656	0	0.777344	1

Results of Experiments

Case	INSEQNO	Actual Outcome	NN - Traditional + HF				NN - Traditional Only				NN - HF Only				LR - Traditional + HF				LR - Traditional Only				LR - HF Only			
			Output		Error		Output		Error		Output		Error		Output		Error		Output		Error		Output		Error	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
TST 105	63	-1	-0.909173	-1	-0.090827	0	-0.904964	-1	-0.095036	0	-0.960867	-1	-0.039133	0	-1.590691	-2	0.590691	1	-0.982905	-1	-0.017095	0	-1.358080	-1	0.358080	0
TST 106	122	-1	-0.909173	-1	-0.090827	0	-0.904881	-1	-0.095119	0	-0.923827	-1	-0.076173	0	-1.305742	-1	0.305742	0	-0.923102	-1	-0.076898	0	-0.806053	-1	-0.193947	0
TST 107	251	1	0.944360	1	0.055640	0	0.974341	1	0.025659	0	0.943003	1	0.056997	0	1.454393	1	-0.454393	0	0.944804	1	0.055196	0	0.947090	1	0.052910	0
TST 108	141	-1	-0.909173	-1	-0.090827	0	-0.904969	-1	-0.095031	0	-0.877853	-1	-0.122147	0	-1.165546	-1	0.165546	0	-1.502700	-2	0.502700	1	-0.262357	0	-0.737643	-1
TST 109	481	1	0.944360	1	0.055640	0	0.934151	1	0.065849	0	0.663103	1	0.336897	0	1.035313	1	-0.035313	0	0.574951	1	0.425049	0	0.404771	0	0.595229	1
TST 110	42	1	0.944360	1	0.055640	0	0.974597	1	0.025403	0	0.943090	1	0.056910	0	0.359722	0	0.640278	1	0.375760	0	0.624240	1	0.809448	1	0.190552	0
TST 111	10	-1	-0.909173	-1	-0.090827	0	-0.903075	-1	-0.096925	0	-0.955024	-1	-0.044976	0	-0.874362	-1	-0.125638	0	-0.759626	-1	-0.240374	0	-0.396947	0	-0.603053	-1
TST 112	279	0	0.944320	1	-0.944320	-1	0.924451	1	-0.924451	-1	0.922461	1	-0.922461	-1	0.204642	0	-0.204642	0	0.200921	0	-0.200921	0	0.299405	0	-0.299405	0
TST 113	232	1	0.944359	1	0.055641	0	0.873120	1	0.126880	0	0.665421	1	0.334579	0	0.781682	1	0.218318	0	0.671989	1	0.328011	0	0.361701	0	0.638299	1
TST 114	207	-1	-0.909173	-1	-0.090827	0	-0.755196	-1	-0.244804	0	-0.959111	-1	-0.040889	0	-0.457597	0	-0.542403	-1	-0.119437	0	-0.880563	-1	-0.493794	0	-0.506206	-1
TST 115	32	1	0.944360	1	0.055640	0	0.974676	1	0.025324	0	0.943076	1	0.056924	0	0.215881	0	0.784119	1	0.555955	1	0.444045	0	0.723644	1	0.276356	0
TST 116	534	0	0.944360	1	-0.944360	-1	0.961961	1	-0.961961	-1	0.939145	1	-0.939145	-1	0.567455	1	-0.567455	-1	0.512565	1	-0.512565	-1	0.424529	0	-0.424529	0
TST 117	166	-1	-0.909173	-1	-0.090827	0	-0.901928	-1	-0.098072	0	-0.251436	0	-0.748564	-1	-0.174345	0	-0.825655	-1	-0.224567	0	-0.775433	-1	0.089667	0	-1.089667	-1
TST 118	350	-1	-0.909173	-1	-0.090827	0	-0.904857	-1	-0.095143	0	-0.251436	0	-0.748564	-1	-0.608727	-1	-0.391273	0	-0.729058	-1	-0.270942	0	0.089667	0	-1.089667	-1
TST 119	132	1	0.944360	1	0.055640	0	0.973631	1	0.026369	0	0.943134	1	0.056866	0	1.178291	1	-0.178291	0	0.888844	1	0.111156	0	0.997563	1	0.002437	0
TST 120	242	1	0.944360	1	0.055640	0	0.974676	1	0.025324	0	0.943152	1	0.056848	0	1.260469	1	-0.260469	0	0.960348	1	0.039652	0	0.877476	1	0.122524	0
TST 121	288	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.942153	1	0.057847	0	1.037987	1	-0.037987	0	1.129990	1	-0.129990	0	0.519901	1	0.480099	0
TST 122	524	1	0.944360	1	0.055640	0	0.718244	1	0.281756	0	0.939145	1	0.060855	0	0.567096	1	0.432904	0	0.333732	0	0.666268	1	0.424529	0	0.575471	1
TST 123	552	1	0.944340	1	0.055660	0	0.877227	1	0.122773	0	0.941786	1	0.058214	0	0.554127	1	0.445873	0	0.423460	0	0.576540	1	0.876778	1	0.123222	0
TST 124	493	1	-0.906971	-1	1.906971	2	0.971723	1	0.028277	0	-0.782950	-1	1.782950	2	-0.104502	0	1.104502	1	0.436427	0	0.563573	1	-0.310219	0	1.310219	1
TST 125	170	-1	-0.909173	-1	-0.090827	0	-0.904960	-1	-0.095040	0	-0.958486	-1	-0.041514	0	-0.757601	-1	-0.242399	0	-0.561083	-1	-0.438917	0	-0.661343	-1	-0.338657	0
TST 126	595	1	0.944360	1	0.055640	0	0.974597	1	0.025403	0	0.941140	1	0.058860	0	1.154380	1	-0.154380	0	0.867570	1	0.132430	0	0.898830	1	0.101170	0
TST 127	622	1	0.944360	1	0.055640	0	0.974678	1	0.025322	0	0.901868	1	0.098132	0	1.379793	1	-0.379793	0	1.902110	2	-0.902110	-1	0.685374	1	0.314626	0
TST 128	280	1	0.944360	1	0.055640	0	0.974680	1	0.025320	0	0.943169	1	0.056831	0	1.599350	2	-0.599350	-1	1.057474	1	-0.057474	0	1.109253	1	-0.109253	0
TST 129	77	-1	-0.909173	-1	-0.090827	0	-0.904927	-1	-0.095073	0	-0.251436	0	-0.748564	-1	-0.430045	0	-0.569955	-1	-0.575847	-1	-0.424153	0	0.089667	0	-1.089667	-1
TST 130	219	1	0.944360	1	0.055640	0	0.974669	1	0.025331	0	0.683909	1	0.316091	0	0.748722	1	0.251278	0	1.288315	1	-0.288315	0	0.368581	0	0.631419	1
TST 131	542	1	-0.909172	-1	1.909172	2	0.845882	1	0.154118	0	-0.304061	0	1.304061	1	-0.019830	0	1.019830	1	0.057355	0	0.942645	1	-0.087949	0	1.087949	1
TST 132	156	1	0.944360	1	0.055640	0	0.974657	1	0.025343	0	0.943157	1	0.056843	0	0.737655	1	0.262345	0	0.389470	0	0.610530	1	1.104990	1	-0.104990	0

APPENDIX D

DATA TRANSFORMATIONS

The following appendix contains data coding for the experimental models used in these experiments. This data coding was provided as an output by the NeuralWare Predict software (1997).

```
I F001 <RAND> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 0.200 160.000 [f 0.00]
   T02 LogLog  -1.00   1.00  Avg 0.300 500.000 [f 0.00]
   T03 fzlft    0.00   1.00  0.200 0.200 0.300 [f 0.00]
   T04 fzrgt    0.00   1.00  500.000 1060.000 1060.000 [f 0.00]
  I F002 <INSEQNO> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 0.200 169.000 [f 0.00]
   T02 LogLog  -1.00   1.00  Avg 0.200 500.000 [f 0.00]
   T03 fzrgt    0.00   1.00  500.000 1060.000 1060.000 [f 0.00]
A I F003 <WOFA1> (miss) [VS group 0 2 30/freq 0.000]
A I F004 <WOFD1> (miss) [VS group 0 2 30/freq 0.000]
A I F005 <YR1> (miss) [VS group 0 2 30/freq 0.000]
A I F006 <MO1> (miss) [VS group 0 2 30/freq 0.000]
A I F007 <DA1> (miss) [VS group 0 2 30/freq 0.000]
A I F008 <HR1> (miss) [VS group 0 2 30/freq 0.000]
A I F009 <WOFA2> (miss) [VS group 0 2 30/freq 0.000]
A I F010 <WOFD2> (miss) [VS group 0 2 30/freq 0.000]
A I F011 <YR2> (miss) [VS group 0 2 30/freq 0.000]
A I F012 <MO2> (miss) [VS group 0 2 30/freq 0.000]
A I F013 <DA2> (miss) [VS group 0 2 30/freq 0.000]
A I F014 <HR2> (miss) [VS group 0 2 30/freq 0.000]
A I F015 <WOFA3> (miss) [VS group 0 2 30/freq 0.000]
A I F016 <WOFD3> (miss) [VS group 0 2 30/freq 0.000]
A I F017 <YR3> (miss) [VS group 0 2 30/freq 0.000]
A I F018 <MO3> (nsd) [VS group 0 2 30/freq 0.000]
  I F019 <DA3> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 0.000 9.000 [f 0.00]
   T02 Inv     -1.00   1.00  Avg 0.000 9.000 [f 0.00]
  I F020 <HR3> [VS group 0 2 30/freq 0.000]
   T01 islit    0.00   1.00  <hd> [f 0.00]
   T02 islit    0.00   1.00  <fd> [f 0.00]
   T03 islit    0.00   1.00  <pd> [f 0.00]
   T04 islit    0.00   1.00  <dl> [f 0.00]
A I F021 <POSTYPE> (miss) [VS group 0 2 30/freq 0.000]
  I F022 <POST1> [VS group 0 2 30/freq 0.000]
   T01 logical  0.00   1.00  1.000 0.000 (0.500) [f 0.00]
   T02 rlogical  0.00   1.00  1.000 0.000 (0.500) [f 0.00]
  I F023 <POST2> [VS group 0 2 30/freq 0.000]
   T01 logical  0.00   1.00  1.000 0.000 (0.500) [f 0.00]
   T02 rlogical  0.00   1.00  1.000 0.000 (0.500) [f 0.00]
  I F024 <FRONT> [VS group 0 2 30/freq 0.000]
   T01 logical  0.00   1.00  1.000 0.000 (0.500) [f 0.00]
   T02 rlogical  0.00   1.00  1.000 0.000 (0.500) [f 0.00]
  I F025 <DEPTH> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg -2.000 3.000 [f 0.00]
   T02 tanh    -1.00   1.00  Avg -2.000 3.000 [f 0.00]
```

```
   T03 fzlft    0.00   1.00  -3.000 -3.000 -2.000 [f 0.00]
  I F026 <TIME> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg -1.000 1.000 [f 0.00]
   T02 tanh    -1.00   1.00  Avg -1.000 1.000 [f 0.00]
  I F027 <SURPA> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 189.000 600000.000 [f 0.00]
   T02 Inv     -1.00   1.00  Avg 1100.000 2200000.000 [f 0.00]
   T03 fzlft    0.00   1.00  189.000 189.000 1100.000 [f 0.00]
  I F028 <AEROA> [VS group 0 2 30/freq 0.000]
   T01 logical  0.00   1.00  1.000 3.000 (0.500) [f 0.00]
A I F029 <STRA> (miss) [VS group 0 2 30/freq 0.000]
A I F030 <CODE A> (miss) [VS group 0 2 30/freq 0.000]
  I F031 <INTSTA> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 6.000 118000.000 [f 0.00]
   T02 LogLog  -1.00   1.00  Avg 6.000 195000.000 [f 0.00]
   T03 fzrgt    0.00   1.00  195000.000 495000.000 495000.000 [f 0
A I F032 <RERPA> (miss) [VS group 0 2 30/freq 0.000]
  I F033 <CASA> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 188.000 480000.000 [f 0.00]
   T02 Inv     -1.00   1.00  Avg 188.000 1372000.000 [f 0.00]
  I F034 <FINSTA> [VS group 0 2 30/freq 0.000]
   T01 logical  0.00   1.00  1.000 3.000 (0.500) [f 0.00]
A I F035 <STRD> (miss) [VS group 0 2 30/freq 0.000]
A I F036 <CODE D> (miss) [VS group 0 2 30/freq 0.000]
  I F037 <INTSTD> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 1.000 153654.000 [f 0.00]
   T02 LogLog  -1.00   1.00  Avg 1.000 210000.000 [f 0.00]
   T03 fzrgt    0.00   1.00  210000.000 885000.000 885000.000 [f 0
A I F038 <RERPD> (miss) [VS group 0 2 30/freq 0.000]
A I F039 <CASD> (miss) [VS group 0 2 30/freq 0.000]
  I F040 <FINSTD> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 0.000 1037.000 [f 0.00]
   T02 Inv     -1.00   1.00  Avg 0.000 4230.000 [f 0.00]
A I F041 <CAVA> (miss) [VS group 0 2 30/freq 0.000]
A I F042 <TANKA> (miss) [VS group 0 2 30/freq 0.000]
A I F043 <LTA> (miss) [VS group 0 2 30/freq 0.000]
A I F044 <MBTA> (miss) [VS group 0 2 30/freq 0.000]
A I F045 <ARTYA> (miss) [VS group 0 2 30/freq 0.000]
A I F046 <FLYA> (miss) [VS group 0 2 30/freq 0.000]
A I F047 <CTANKA> (miss) [VS group 0 2 30/freq 0.000]
A I F048 <CARTYA> (miss) [VS group 0 2 30/freq 0.000]
  I F049 <CFLYA> [VS group 0 2 30/freq 0.000]
   T01 Linear  -1.00   1.00  Avg 0.000 852.000 [f 0.00]
   T02 LogLog  -1.00   1.00  Avg 0.000 1200.000 [f 0.00]
   T03 fzrgt    0.00   1.00  1200.000 2160.000 2160.000 [f 0.00]
A I F050 <CAVD> (miss) [VS group 0 2 30/freq 0.000]
```

```
A I F051 <TANKD> (miss) [VS group 0 2 30/freq 0.000]
A I F052 <LTD> (miss) [VS group 0 2 30/freq 0.000]
A I F053 <MBTD> (miss) [VS group 0 2 30/freq 0.000]
A I F054 <ARTYD> (miss) [VS group 0 2 30/freq 0.000]
A I F055 <FLYD> (miss) [VS group 0 2 30/freq 0.000]
A I F056 <CTANKD> (miss) [VS group 0 2 30/freq 0.000]
 I F057 <CARTYD> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -2.000 2.000 [f 0.00]
  T02 tanh    -1.00  1.00 Avg -2.000 2.000 [f 0.00]
 I F058 <CFLYD> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T02 Pwr2    -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T03 fzlft    0.00  1.00 -2.000 -2.000 -1.000 [f 0.00]
 I F059 <CEA> [VS group 0 2 30/freq 0.000]
  T01 logical  0.00  1.00 1.000 0.000 (0.500) [f 0.00]
  T02 rlogical 0.00  1.00 1.000 0.000 (0.500) [f 0.00]
 I F060 <LOGSA> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T02 Pwr2    -1.00  1.00 Avg -1.000 2.000 [f 0.00]
 I F061 <MOMNTA> [VS group 0 2 30/freq 0.000]
  T01 Rt2     -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T02 Linear  -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T03 fzrgt    0.00  1.00 2.000 3.000 3.000 [f 0.00]
 I F062 <TECHA> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -11.200 160.000 [f 0.00]
  T02 Inv     -1.00  1.00 Avg -6.400 160.000 [f 0.00]
  T03 fzlft    0.00  1.00 -65.000 -65.000 -6.400 [f 0.00]
  T04 fzrgt    0.00  1.00 160.000 483.000 483.000 [f 0.00]
 I F063 <INITA> [VS group 0 2 30/freq 0.000]
  T01 logical  0.00  1.00 2.000 1.000 (0.500) [f 0.00]
  T02 rlogical 0.00  1.00 2.000 1.000 (0.500) [f 0.00]
 I F064 <KMDA> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -2.000 2.000 [f 0.00]
  T02 tanh    -1.00  1.00 Avg -2.000 2.000 [f 0.00]
 I F065 <CRIT> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -2.000 2.000 [f 0.00]
  T02 tanh    -1.00  1.00 Avg -2.000 2.000 [f 0.00]
 I F066 <QUALA> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -1.000 1.000 [f 0.00]
  T02 tanh    -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T03 fzlft    0.00  1.00 -2.000 -2.000 -1.000 [f 0.00]
 I F067 <RESA> [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T02 tanh    -1.00  1.00 Avg -1.000 2.000 [f 0.00]
  T03 fzlft    0.00  1.00 -2.000 -2.000 -1.000 [f 0.00]
 I F068 <MOBILA> [VS group 0 2 30/freq 0.000]
```

```
    T01 Linear  -1.00   1.00  Avg -1.000 2.000 [f 0.00]
    T02 Pwr2    -1.00   1.00  Avg -1.000 2.000 [f 0.00]
    T03 fzlft    0.00   1.00 -2.000 -2.000 -1.000 [f 0.00]
  I F069 <AIRA> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg -2.000 2.000 [f 0.00]
    T02 tanh    -1.00   1.00  Avg -2.000 2.000 [f 0.00]
  I F070 <FPREPA> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg -1.000 2.000 [f 0.00]
    T02 Pwr2    -1.00   1.00  Avg -1.000 2.000 [f 0.00]
    T03 fzlft    0.00   1.00 -2.000 -2.000 -1.000 [f 0.00]
  I F071 <PLANA> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg -1.000 2.000 [f 0.00]
    T02 tanh    -1.00   1.00  Avg -1.000 2.000 [f 0.00]
  I F072 <SURPAA> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg -1.000 1.000 [f 0.00]
    T02 Pwr2    -1.00   1.00  Avg -1.000 1.000 [f 0.00]
    T03 fzrgt    0.00   1.00  1.000 2.000 2.000 [f 0.00]
  I F073 <MANA> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg -2.000 1.000 [f 0.00]
    T02 tanh    -1.00   1.00  Avg -2.000 1.000 [f 0.00]
  I F074 <LOGSAA> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg -1.000 1.000 [f 0.00]
    T02 Pwr2    -1.00   1.00  Avg -1.000 1.000 [f 0.00]
    T03 fzrgt    0.00   1.00  1.000 2.000 2.000 [f 0.00]
  I F075 <FORTSA> [VS group 0 2 30/freq 0.000]
    T01 islit    0.00   1.00 <ff> [f 0.00]
    T02 islit    0.00   1.00 <ee> [f 0.00]
    T03 islit    0.00   1.00 <rc> [f 0.00]
A I F076 <DEEPA> (miss) [VS group 0 2 30/freq 0.000]
A I F077 <PRIA1> (miss) [VS group 0 2 30/freq 0.000]
A I F078 <PRIA2> (miss) [VS group 0 2 30/freq 0.000]
A I F079 <PRIA2> (miss) [VS group 0 2 30/freq 0.000]
A I F080 <SECA1> (miss) [VS group 0 2 30/freq 0.000]
  I F081 <SECA2> [VS group 0 2 30/freq 0.000]
    T01 islit    0.00   1.00 <dd> [f 0.00]
    T02 islit    0.00   1.00 <do> [f 0.00]
A I F082 <SECA3> (miss) [VS group 0 2 30/freq 0.000]
A I F083 <PRID1> (miss) [VS group 0 2 30/freq 0.000]
A I F084 <PRID2> (miss) [VS group 0 2 30/freq 0.000]
A I F085 <PRID3> (miss) [VS group 0 2 30/freq 0.000]
A I F086 <SECD1> (nsd) [VS group 0 2 30/freq 0.000]
  I F087 <SECD2> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg 1.000 5.000 [f 0.00]
    T02 Inv     -1.00   1.00  Avg 1.000 8.000 [f 0.00]
  I F088 <SECD3> [VS group 0 2 30/freq 0.000]
    T01 Linear  -1.00   1.00  Avg 1620.000 1973.000 [f 0.00]
```

```
    T02 tanh   -1.00  1.00  Avg 1600.000 1973.000 [f 0.00]
    T03 fzrgt   0.00  1.00  1973.000 1982.000 1982.000 [f 0.00]
  I F089 <NOATP> [VS group 0 2 30/freq 0.000]
    T01 Linear -1.00  1.00  Avg 1.000 12.000 [f 0.00]
    T02 tanh   -1.00  1.00  Avg 1.000 12.000 [f 0.00]
  I F090 <ATPBYR1> [VS group 0 2 30/freq 0.000]
    T01 Linear -1.00  1.00  Avg 1.000 31.000 [f 0.00]
    T02 Pwr2   -1.00  1.00  Avg 1.000 31.000 [f 0.00]
A I F091 <ATPBMN1> (miss) [VS group 0 2 30/freq 0.000]
  I F092 <ATPBDA1> [VS group 0 2 30/freq 0.000]
    T01 Linear -1.00  1.00  Avg 1620.000 1973.000 [f 0.00]
    T02 tanh   -1.00  1.00  Avg 1600.000 1973.000 [f 0.00]
    T03 fzrgt   0.00  1.00  1973.000 1982.000 1982.000 [f 0.00]
  I F093 <ATPBHR1> [VS group 0 2 30/freq 0.000]
    T01 Linear -1.00  1.00  Avg 1.000 12.000 [f 0.00]
    T02 tanh   -1.00  1.00  Avg 1.000 12.000 [f 0.00]
  I F094 <ATPEYR1> [VS group 0 2 30/freq 0.000]
    T01 Linear -1.00  1.00  Avg 1.000 31.000 [f 0.00]
    T02 Pwr2   -1.00  1.00  Avg 1.000 31.000 [f 0.00]
A I F095 <ATPEMN1> (miss) [VS group 0 2 30/freq 0.000]
  I F096 <ATPEDA1> [VS group 0 2 30/freq 0.000]
    T01 islit   0.00  1.00 <r> [f 0.00]
    T02 islit   0.00  1.00 <g> [f 0.00]
    T03 islit   0.00  1.00 <f> [f 0.00]
  I F097 <ATPEHR1> [VS group 0 2 30/freq 0.000]
    T01 islit   0.00  1.00 <m> [f 0.00]
    T02 islit   0.00  1.00 <b> [f 0.00]
    T03 islit   0.00  1.00 <d> [f 0.00]
    T04 islit   0.00  1.00 <w> [f 0.00]
A I F098 <TERRA1.1> (const) [VS group 0 2 30/freq 0.000]
A I F099 <TERRA1.2> (miss) [VS group 0 2 30/freq 0.000]
A I F100 <TERRA1.3> (miss) [VS group 0 2 30/freq 0.000]
A I F101 <TERRA2.1> (miss) [VS group 0 2 30/freq 0.000]
  I F102 <TERRA2.2> [VS group 0 2 30/freq 0.000]
    T01 islit   0.00  1.00 <w> [f 0.00]
  I F103 <TERRA2.3> [VS group 0 2 30/freq 0.000]
    T01 islit   0.00  1.00 <s> [f 0.00]
    T02 islit   0.00  1.00 <l> [f 0.00]
    T03 islit   0.00  1.00 <h> [f 0.00]
    T04 islit   0.00  1.00 <o> [f 0.00]
  I F104 <WX1.1> [VS group 0 2 30/freq 0.000]
    T01 islit   0.00  1.00 <t> [f 0.00]
    T02 islit   0.00  1.00 <h> [f 0.00]
    T03 islit   0.00  1.00 <c> [f 0.00]
  I F105 <WX1.2> [VS group 0 2 30/freq 0.000]
    T01 islit   0.00  1.00 <d> [f 0.00]
```

```
A I F106 <WX1.3>  (miss) [VS group 0 2 30/freq 0.000]
A I F107 <WX1.4>  (miss) [VS group 0 2 30/freq 0.000]
A I F108 <WX2.1>  (miss) [VS group 0 2 30/freq 0.000]
A I F109 <WX2.2>  (miss) [VS group 0 2 30/freq 0.000]
A I F110 <WX2.3>  (const2) [VS group 0 2 30/freq 0.000]
A I F111 <WX2.4>  (miss) [VS group 0 2 30/freq 0.000]
A I F112 <WX3.1>  (miss) [VS group 0 2 30/freq 0.000]
A I F113 <WX3.2>  (const2) [VS group 0 2 30/freq 0.000]
 I F114 <WX3.3>  [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00   1.00  Avg -1.000 2.000 [f 0.00]
  T02 Pwr2    -1.00   1.00  Avg -1.000 2.000 [f 0.00]
  T03 fzlft    0.00   1.00  -2.000 -2.000 -1.000 [f 0.00]
 I F115 <WX3.4>  [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00   1.00  Avg -2.000 2.000 [f 0.00]
  T02 tanh    -1.00   1.00  Avg -2.000 2.000 [f 0.00]
 I F116 <LEADA>  [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00   1.00  Avg -1.000 2.000 [f 0.00]
  T02 Pwr2    -1.00   1.00  Avg -1.000 2.000 [f 0.00]
  T03 fzlft    0.00   1.00  -2.000 -2.000 -1.000 [f 0.00]
 I F117 <TRNGA>  [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00   1.00  Avg -1.000 2.000 [f 0.00]
  T02 Pwr2    -1.00   1.00  Avg -1.000 2.000 [f 0.00]
  T03 fzlft    0.00   1.00  -2.000 -2.000 -1.000 [f 0.00]
 I F118 <MORALA>  [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00   1.00  Avg -1.000 1.000 [f 0.00]
  T02 Pwr2    -1.00   1.00  Avg -1.000 1.000 [f 0.00]
  T03 fzlft    0.00   1.00  -2.000 -2.000 -1.000 [f 0.00]
  T04 fzrgt    0.00   1.00  1.000 2.000 2.000 [f 0.00]
 I F119 <INTELA>  [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00   1.00  Avg -2.000 1.000 [f 0.00]
  T02 tanh    -1.00   1.00  Avg -2.000 1.000 [f 0.00]
 I F120 <WXA>  [VS group 0 2 30/freq 0.000]
  T01 Linear  -1.00   1.00  Avg -2.000 2.000 [f 0.00]
  T02 tanh    -1.00   1.00  Avg -2.000 4.000 [f 0.00]
  T03 fzlft    0.00   1.00  -3.000 -3.000 -2.000 [f 0.00]
 O F121 <TERRA>
  T01 Linear   0.00   1.00  Avg -1.000 1.000
```

APPENDIX E

CODING FOR DATA TRANSFORMATIONS

The following Appendix is from the NeuralWare predict manual (1997). This section explains the coding used in the data transformations used in the previous Appendix.

Field Format

Data fields have the following format:

```
S T Fxxx <Name> (reason) [VS group G m M/freq F]
```

S is the skip flag. If it is set to any value not equal to 'F', it means the field is not used in the model. It can take on the following values:

A This field was skipped as a result of the analysis phase.
U This field was explicitly disabled by the user.
V The variable selection algorithm rejected all transforms associated with this field.
P All transforms have been purged for this field.
F All transforms have been forced to be accepted by the variable selection and cascaded variable selection algorithms.
C The cascaded variable selection algorithm rejected all transforms associated with this field.
blank This field is active.

If the field was skipped as a result of the analysis phase, one of the following *reasons* is shown:

notran The field did not meet the criteria for any of the selected transformations.
date The field contains primarily dates.
date2 The field contains numbers which fall into a pattern of dates for days of the week.
const The range of data in a numeric field is less than 0.0000001.
const2 An enumerated field has one outcome.
seq1 Succeeding records in a field differ by a constant integer value.
seq2 Succeeding records in a field differ primarily by a constant.
nan The field contains too many illegal format numbers.
nc The field contains more than a pre-specified limit on the number of Don't Care values.
ovfl More than 50 unique integers or 50 enumerated strings on a classification problem.
nsd An enumerated field or logical (two-valued) field has primarily one outcome.
miss Too many missing data items.

T tells what type of field. It can take in the following values:

I Input field
O Output field

Fxxx is the field number.

<Name> is the user-specified name for the field from the Field Names range of the worksheet. If you don't specify names in your worksheet, default names of the form <UNTITLEDxxx> are used.

VS group G m M shows the group information for this field. Fields can be grouped together or singly for the purpose of variable selection. *G* is the group identifier, *m* and *M* show the minimum and maximum number of transforms the variable selection algorithm must pick for this group. By default all fields are in the same group which has identifier *0*.

freq F shows the frequency of the field in the final population of the variable selection algorithm.

Transformation Format

After each field is a list of transformations for the field that have been selected as a result of the data analysis. Transformations have the following format in the *Data Analysis Table*:

```
S TXX Transform [Parameters] [f F]
```

S is the skip flag. If it is set to any value except 'F', it means the transform is not used in the model. It can take on the following values:

U	You, the user, explicitly disabled this transform.
V	The variable selection algorithm rejected this transform.
P	This transform has been marked for purging.
F	You, the user, explicitly forced the variable selection algorithm to accept this transform.
C	The cascaded variable selection algorithm rejected this transform.
blank	This transform is active.

Txx is the transform number.

f shows the frequency of this transformation in the final population of the variable selection algorithm.

Continuous Transformations

The format for continuous transformations in the *Data Analysis Table* is:

S TXX Transform Tmin Tmax Method Imin Imax

The general form of a continuous transformation is:

$$y = s_o \, \mathrm{f}(s_i x + o_i) + o_o$$

where:

f is a continuous function
s_i, o_i implement an inner scaling of the raw data to map it to an optimal sub-domain of **f**.
s_o, o_o implement an outer scaling so that y lies within a suitable range for the neural net.

In the *Data Analysis Table*, each *Transform* is identified by its continuous function **f** which can be any one of the following:

Linear	Identity function
Log	Natural logarithm function
LogLog	Log of Log
Exp	Exponential function
ExpExp	Exp of Exp
Pwr2	Square function
Pwr4	Fourth Power function
Rt2	Square root function
Rt4	Fourth root function
Inv	Inverse function (1/x)
InvPwr2	1 / (Square function)
InvPwr4	1 / (Fourth Power function)
InvRt2	1 / (Square root function)
InvRt4	1 / (Fourth root function)
Tanh	Hyperbolic tangent function
ln x/(1-x)	Log (x/(1-x))

Imin and *Imax* are the effective minimum and maximum of the raw data for the field. There may be data points *Predict* considers to be outliers which lie outside *Imin* and *Imax*. *Tmin* and *Tmax* are the range of the "y" output when the continuous transformation formula has been applied to the *Imin* and *Imax*.

Method determines how the data is mapped into the transformed range. *Method* can take three values:

Avg The average of the transformed data is mapped to the mid point of the transformed range.
Med The median of the transformed data is mapped to the mid-point of the transformed range.
Rng *Imin* is mapped to *Tmin* and *Imax* is mapped to *Tmax*.

Logical Transformations
There are two types of logical transformations: logical and reverse logical. Their format in the *Data Analysis Table* is:

S Txx logical Tmin Tmax Imin Imax
S Txx rlogical Tmin Tmax Imin Imax

These transforms are defined as follows:

logical:

$$y = T_{max} \qquad if\ x > \frac{I_{min} + I_{max}}{2}$$
$$y = T_{min} \qquad Otherwise$$

rlogical:

$$y = T_{max} \qquad if\ x \leq \frac{I_{min} + I_{max}}{2}$$
$$y = T_{min} \qquad Otherwise$$

Enumerated Integer Transforms

The format of this type of transformation is

S Txx isint Tmin Tmax Value

The meaning of this is that the transform outputs a value of *Tmax* when the field value is equal to *Value*, and a value of *Tmin* otherwise.

Enumerated String Transforms

The format of this type of transformation is

S Txx islit Tmin Tmax String

The meaning of this is that the transform outputs a value of *Tmax* when the field has a string value equal to *String*, and a value of *Tmin* otherwise.

Fuzzy Transformations

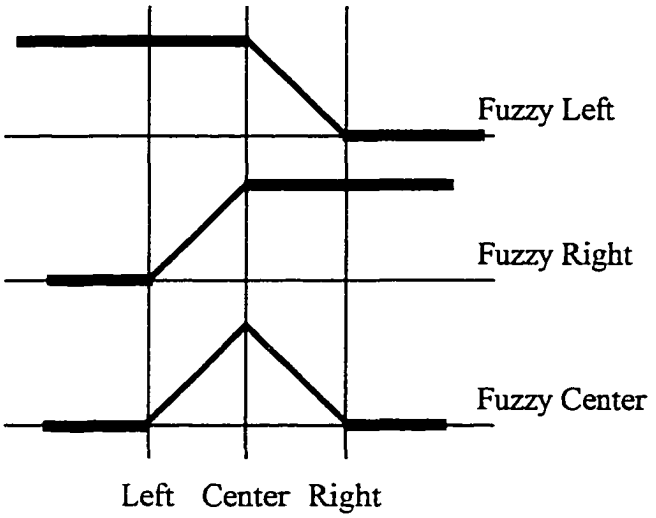
There are four types of fuzzy transformations:

fzlft fuzzy left
fzrgt fuzzy right
fzraw fuzzy center on raw data

Their format in the *Data Analysis Table* is:

S Txx Transform Tmin Tmax FLeft FCenter FRight

Tmin and *Tmax* are the minimum and maximum transformed values, always zero and one. *FLeft*, *FCenter*, and *FRight* are the left, center, and right transition points as shown below.



Quintile Transformation
This transformation consists of five piece-wise linear transformations that map the input data into the target range. The format of the quintile transformation is:

S Txx quint Tmin Tmax P0 P1 P2 P3 P4 P5

The points P_i are the transition points for which the piece-wise linear models are estimated. Raw data in the range *P0* to *P1* is mapped into the range *(Tmin)* to *(Tmin+0.2*(Tmax-Tmin))*. Data in the range *P1* to *P2* is mapped into the range *(Tmin+0.2*(Tmax-Tmin))* to *(Tmin+0.4*(Tmax-Tmin))* and so on. The transition points are selected so that approximately equal numbers of data in the working set map into each range.

Other Transformations
There are two miscellaneous transforms:

S Txx other Tmin Tmax

and

S Txx NaN Tmin Tmax

The first of these is generated for enumerated fields, if there are two or more categories that rarely occur. These rare categories are combined together into an *other* category. The output of this transform has a value of *Tmax* if the field value doesn't match any of the *isint* values or *islit* strings of the common categories; otherwise it has a value of *Tmin*.

The *NaN* transform is used to indicate that a numeric input field was either missing or an invalid number. If the field is missing or contains an illegal number, the result of this transform is *Tmax*. Otherwise it is *Tmin*.

APPENDIX F

RANDOMIZATION TABLE

The following Appendix contains the randomization table used to select independent test data sets from the database provided by US Army Concepts Analysis Agency. Each battle was assigned a random number and arranged in that order.

INSEQNO	RAND	INSEQNO	RAND	INSEQNO	RAND	INSEQNO	RAND
1	0.09144	51	0.78931	101	0.22488	151	0.55466
2	0.24233	52	0.04079	102	0.78506	152	0.53371
3	0.86499	53	0.83162	103	0.32819	153	0.76862
4	0.29222	54	0.55980	104	0.41264	154	0.78243
5	0.10837	55	0.02427	105	0.78905	155	0.44942
6	0.52724	56	0.59424	106	0.42583	156	0.99964
7	0.24165	57	0.27892	107	0.27424	157	0.67626
8	0.43057	58	0.45730	108	0.51184	158	0.79071
9	0.81629	59	0.37921	109	0.04036	159	0.79993
10	0.97239	60	0.38805	110	0.56190	160	0.28725
11	0.04110	61	0.22769	111	0.63111	161	0.25839
12	0.88980	62	0.35788	112	0.37634	162	0.83994
13	0.90693	63	0.96642	113	0.20458	163	0.23089
14	0.16885	64	0.37434	114	0.35743	164	0.77016
15	0.43890	65	0.56815	115	0.54404	165	0.94008
16	0.64118	66	0.01970	116	0.24383	166	0.72261
17	0.24040	67	0.70361	117	0.86619	167	0.96602
18	0.21776	68	0.39584	118	0.07309	168	0.48419
19	0.80160	69	0.71104	119	0.00453	169	0.46714
20	0.67704	70	0.30982	120	0.74341	170	0.99249
21	0.45254	71	0.93803	121	0.19456	171	0.45403
22	0.61006	72	0.65284	122	0.96879	172	0.26115
23	0.62100	73	0.79713	123	0.65843	173	0.92270
24	0.06147	74	0.80774	124	0.65724	174	0.07339
25	0.94274	75	0.03199	125	0.00065	175	0.02010
26	0.85094	76	0.38242	126	0.57641	176	0.59437
27	0.30876	77	0.99528	127	0.17936	177	0.51808
28	0.57465	78	0.89625	128	0.70659	178	0.23681
29	0.85256	79	0.32291	129	0.67223	179	0.92085
30	0.24127	80	0.52755	130	0.14957	180	0.83157
31	0.72842	81	0.27316	131	0.15190	181	0.10247
32	0.97805	82	0.90442	132	0.98320	182	0.59465
33	0.60268	83	0.49791	133	0.26011	183	0.24227
34	0.11031	84	0.22509	134	0.71591	184	0.58253
35	0.58176	85	0.80773	135	0.17357	185	0.22694
36	0.65387	86	0.89270	136	0.79568	186	0.97976
37	0.89720	87	0.37520	137	0.56093	187	0.41313
38	0.57360	88	0.07481	138	0.11021	188	0.60025
39	0.49416	89	0.87339	139	0.59917	189	0.26810
40	0.33740	90	0.78104	140	0.68555	190	0.20023
41	0.84531	91	0.76605	141	0.96987	191	0.62322
42	0.97132	92	0.59948	142	0.27416	192	0.84048
43	0.58177	93	0.66253	143	0.77056	193	0.56991
44	0.75383	94	0.90012	144	0.92460	194	0.27993
45	0.62399	95	0.28700	145	0.66937	195	0.39095
46	0.44739	96	0.80289	146	0.08173	196	0.74051
47	0.02537	97	0.42186	147	0.84641	197	0.78362
48	0.40957	98	0.30970	148	0.79910	198	0.09779
49	0.62370	99	0.76995	149	0.13012	199	0.64509
50	0.57841	100	0.87018	150	0.14880	200	0.67913

INSEQNO	RAND	INSEQNO	RAND	INSEQNO	RAND	INSEQNO	RAND
201	0.92152	251	0.96960	301	0.12340	351	0.34145
202	0.43877	252	0.66159	302	0.08461	352	0.57722
203	0.33432	253	0.65346	303	0.13020	353	0.06366
204	0.55453	254	0.83307	304	0.90659	354	0.42358
205	0.29030	255	0.76245	305	0.87907	355	0.19468
206	0.20352	256	0.19660	306	0.53274	356	0.19351
207	0.97504	257	0.05345	307	0.24372	357	0.71476
208	0.06149	258	0.13324	308	0.81915	358	0.86997
209	0.08538	259	0.78717	309	0.07701	359	0.16448
210	0.74815	260	0.00578	310	0.48477	360	0.59823
211	0.77838	261	0.95412	311	0.13307	361	0.40369
212	0.70898	262	0.66262	312	0.07035	362	0.87150
213	0.09562	263	0.80681	313	0.11395	363	0.21307
214	0.32614	264	0.93531	314	0.32086	364	0.82011
215	0.23470	265	0.93293	315	0.37971	365	0.50553
216	0.18511	266	0.52787	316	0.35526	366	0.06132
217	0.16566	267	0.44831	317	0.26748	367	0.46845
218	0.14304	268	0.09911	318	0.08974	368	0.83337
219	0.99886	269	0.57753	319	0.54989	369	0.69080
220	0.01896	270	0.15336	320	0.68008	370	0.53642
221	0.37631	271	0.39585	321	0.26377	371	0.39092
222	0.93322	272	0.86278	322	0.67675	372	0.42060
223	0.40987	273	0.58427	323	0.55361	373	0.91244
224	0.49553	274	0.35260	324	0.23443	374	0.32852
225	0.77111	275	0.05667	325	0.59228	375	0.59409
226	0.28232	276	0.78414	326	0.01797	376	0.77782
227	0.89525	277	0.25043	327	0.73698	377	0.21522
228	0.42134	278	0.71365	328	0.08853	378	0.88860
229	0.23390	279	0.97371	329	0.65272	379	0.15643
230	0.32338	280	0.99512	330	0.59186	380	0.52836
231	0.16259	281	0.24687	331	0.85456	381	0.25803
232	0.97403	282	0.75665	332	0.81143	382	0.30326
233	0.16151	283	0.22504	333	0.22357	383	0.56569
234	0.42135	284	0.32349	334	0.89588	384	0.90020
235	0.26814	285	0.18681	335	0.63305	385	0.05573
236	0.64923	286	0.87733	336	0.42026	386	0.54193
237	0.31838	287	0.44677	337	0.57088	387	0.45989
238	0.02570	288	0.98734	338	0.78394	388	0.74791
239	0.64787	289	0.85069	339	0.32867	389	0.41062
240	0.95880	290	0.82503	340	0.10682	390	0.92285
241	0.56112	291	0.85639	341	0.32606	391	0.54718
242	0.98557	292	0.79961	342	0.41102	392	0.10692
243	0.47746	293	0.16440	343	0.78971	393	0.27363
244	0.31253	294	0.75078	344	0.90474	394	0.51599
245	0.54996	295	0.65507	345	0.62423	395	0.75428
246	0.32147	296	0.68424	346	0.76604	396	0.95227
247	0.41456	297	0.15759	347	0.49136	397	0.46063
248	0.60675	298	0.87781	348	0.83809	398	0.06306
249	0.13865	299	0.20343	349	0.10384	399	0.48877
250	0.89561	300	0.06455	350	0.98107	400	0.37375

INSEQNO	RAND	INSEQNO	RAND	INSEQNO	RAND	INSEQNO	RAND
401	0.82404	451	0.50210	501	0.02783	551	0.52233
402	0.13653	452	0.32477	502	0.49613	552	0.99022
403	0.04577	453	0.82204	503	0.65578	553	0.17912
404	0.73725	454	0.48915	504	0.59648	554	0.36557
405	0.77234	455	0.19449	505	0.23498	555	0.46700
406	0.40730	456	0.34482	506	0.92855	556	0.58610
407	0.30255	457	0.67156	507	0.48789	557	0.31534
408	0.54563	458	0.62104	508	0.73841	558	0.15352
409	0.85860	459	0.41150	509	0.16615	559	0.92897
410	0.50946	460	0.50766	510	0.93139	560	0.64558
411	0.58509	461	0.95485	511	0.39943	561	0.41966
412	0.39451	462	0.78197	512	0.01866	562	0.65927
413	0.65472	463	0.93602	513	0.50006	563	0.89937
414	0.24946	464	0.88122	514	0.31171	564	0.94043
415	0.15511	465	0.66122	515	0.51303	565	0.22334
416	0.58656	466	0.01819	516	0.66752	566	0.64877
417	0.84920	467	0.87446	517	0.93740	567	0.77545
418	0.17397	468	0.27125	518	0.38311	568	0.87858
419	0.78799	469	0.20280	519	0.68961	569	0.78743
420	0.09283	470	0.88473	520	0.82483	570	0.54085
421	0.85980	471	0.10870	521	0.84148	571	0.94700
422	0.28024	472	0.72868	522	0.37794	572	0.69621
423	0.47644	473	0.60810	523	0.00721	573	0.71442
424	0.32751	474	0.38078	524	0.98809	574	0.57921
425	0.72304	475	0.83937	525	0.24056	575	0.63991
426	0.18931	476	0.63775	526	0.75904	576	0.80809
427	0.37842	477	0.53681	527	0.76982	577	0.41898
428	0.67531	478	0.25614	528	0.63436	578	0.01526
429	0.40259	479	0.80686	529	0.26507	579	0.12568
430	0.01784	480	0.36980	530	0.45230	580	0.53440
431	0.43263	481	0.97020	531	0.27572	581	0.54304
432	0.04135	482	0.55821	532	0.07221	582	0.41211
433	0.33555	483	0.36252	533	0.42957	583	0.53829
434	0.63267	484	0.50332	534	0.97898	584	0.72518
435	0.69049	485	0.35261	535	0.78778	585	0.23852
436	0.47579	486	0.17907	536	0.01122	586	0.66939
437	0.92463	487	0.85389	537	0.36262	587	0.26344
438	0.04034	488	0.26571	538	0.52857	588	0.50001
439	0.39876	489	0.72838	539	0.29015	589	0.85089
440	0.44487	490	0.64825	540	0.79848	590	0.75606
441	0.27695	491	0.72236	541	0.03918	591	0.43620
442	0.10654	492	0.49229	542	0.99932	592	0.17470
443	0.50094	493	0.99244	543	0.57328	593	0.92948
444	0.94926	494	0.93716	544	0.38323	594	0.60430
445	0.85492	495	0.10424	545	0.90509	595	0.99466
446	0.34777	496	0.91609	546	0.12025	596	0.72673
447	0.69668	497	0.13268	547	0.18267	597	0.47202
448	0.27051	498	0.27748	548	0.24553	598	0.89033
449	0.84339	499	0.32047	549	0.59765	599	0.15842
450	0.10032	500	0.49973	550	0.74354	600	0.09203

INSEQNO	RAND	INSEQNO	RAND	INSEQNO	RAND
601	0.07905	652	0.88201		
602	0.53927	653	0.41559		
603	0.37927	654	0.72113		
604	0.04423	655	0.46254		
605	0.60067	657	0.77364		
606	0.41909	658	0.12692		
607	0.13605	659	0.66481		
608	0.31038	660	0.29955		
609	0.49858				
610	0.78762				
611	0.40690				
612	0.39547				
613	0.08409				
614	0.02695				
615	0.90035				
616	0.56599				
617	0.84381				
618	0.23112				
619	0.08852				
620	0.52733				
621	0.09325				
622	0.99479				
623	0.04679				
624	0.76337				
625	0.27257				
626	0.14980				
627	0.36824				
628	0.73641				
629	0.45108				
630	0.28824				
631	0.02938				
632	0.72794				
633	0.33023				
634	0.40571				
635	0.69117				
636	0.18448				
637	0.94501				
638	0.16354				
639	0.31923				
641	0.34477				
642	0.21269				
643	0.00053				
644	0.45714				
645	0.77703				
646	0.44990				
647	0.69436				
648	0.53821				
649	0.01621				
650	0.42979				
651	0.13081				

VITA

David A. Glovier is currently employed with Boeing as a Technical Manager for Boeing Information Systems and Old Dominion University as an Adjunct Instructor. He also holds a bachelor's degree in electrical engineering and a master's degree in engineering management. His areas of interest include modeling and simulation, artificial intelligence, neural networks, communications, and information technology systems.

Previous employment has included Joint Chiefs of Staff - C4ISR Joint Battle Center (JCS), Defense Information Systems Agency (DISA), Joint Training Analysis and Simulation Center (JTASC), Space and Naval Warfare Systems Command (SPAWAR), Naval Command Control and Ocean Surveillance Center - In Service Engineering, East Coast Detachment (NISE East DET Norfolk), Naval Electronics Systems Center – Portsmouth (NAVELEX), and Naval Sea Combat Systems.

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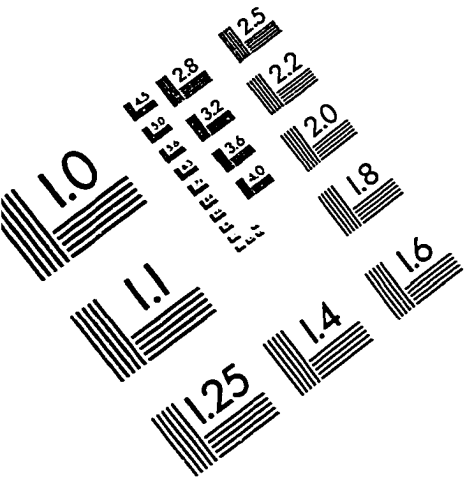
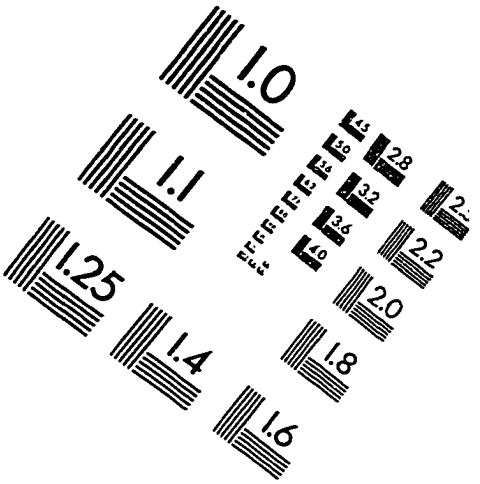
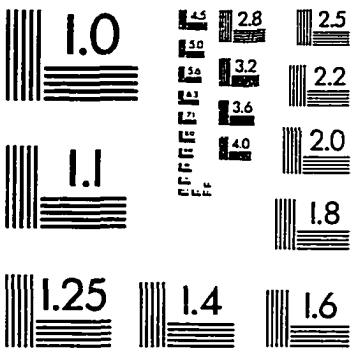
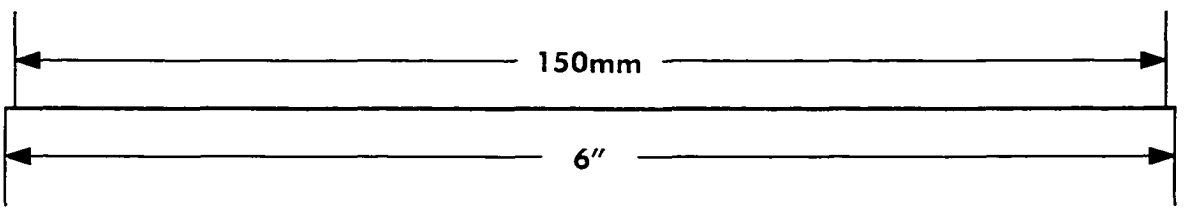
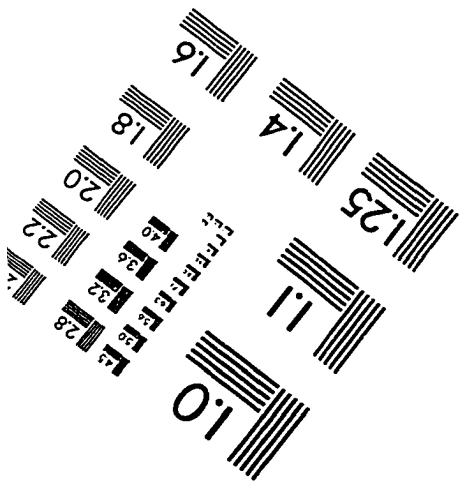
IMAGE EVALUATION TEST TARGET (QA-3)

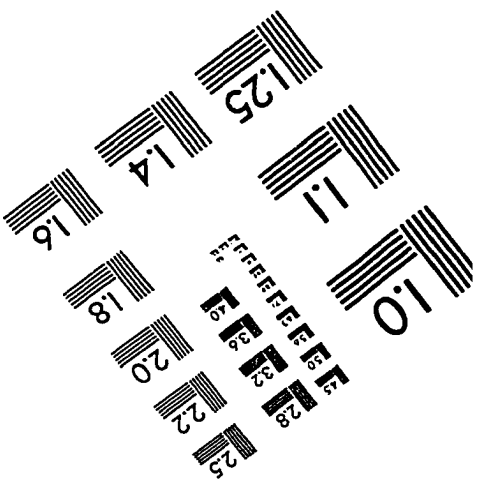












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